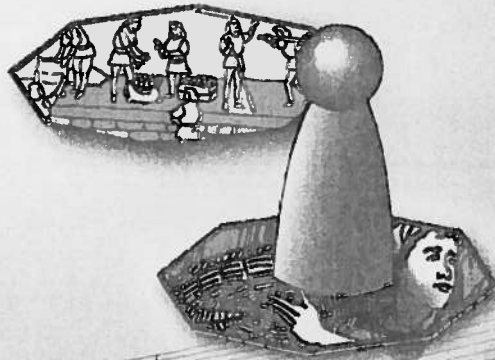


# Key to Percents<sup>®</sup>

1

Student  
Workbook

## PERCENT CONCEPTS



By Steven Rasmussen and David Rasmussen

Name \_\_\_\_\_

Class \_\_\_\_\_

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## About the Cover:

Percent is a mathematical concept that has been used since the end of the fifteenth century in business problems such as computing interest, profits and losses, and taxes. However, the idea had its origin much earlier. When the Roman emperor, Caesar Augustus, levied a tax on all goods sold at auction, *centesima rerum venalium*, the rate was 1/100 of the value. Other Roman taxes were 1/20 on the value of every freed slave and 1/25 on the price of every slave sold. Without recognizing percentages as such, the Romans used fractions easily converted to hundredths.

Just as in Roman times, many of the taxes we pay today are based on percents. Sales taxes are based on a percent of the sales price of items we buy. We pay a percent of our incomes as income tax. Property taxes are based on a percent of a property's value.



Cover art by James Dyckman

On the cover of this booklet the Roman emperor, Caesar Augustus, presides over the Roman auction.

Note: Some of this material is from "Percent," an essay by Harlen E. Amundson published in *Topics for the Mathematics Classroom*, the Thirty-Fifth Yearbook of the National Council of Teachers of Mathematics. Used by permission of the NCTM.

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# Percent Hunt

Percents are used in many places. They're used in newspaper ads, food and medicine labels, weather reports, and on tax forms. Sometimes a percent is written using the word "percent," and sometimes it is written using "%," the symbol for percent. This symbol is called the percent sign.

Find and circle each percent below.

PLUS **33 1/3%** OFF ALL VITAMINS

**110% Price Guarantee**

Buy from Uncle Ralph's, and if your purchase is subsequently advertised locally for less, even by us, bring us the ad within 30 days of purchase. We will send you the difference plus 10% of the difference for your trouble.

**NUTRITION INFORMATION PER PORTION**  
 PORTION SIZE (SOLIDS & LIQUID) 5 1/2 OUNCES  
 PORTIONS PER CONTAINER 1  
 CALORIES 19  
 PROTEIN 100  
 CARBOHYDRATE 4  
 PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)  
 VITAMIN A 45% THIAMINE 8% IRON 4%  
 VITAMIN C 45% RIBOFLAVIN 8% PHOSPHORUS 15%  
 CONTAINS LESS THAN 2 PERCENT OF THE U.S. RDA OF THESE VITAMINS  
 INGREDIENTS: CLAMS, CLAM JUICE (WATER EXTRACT OF CLAMS), SALT, SODIUM POLYPHOSPHATE (TO PREVENT CLAMMING), CALCIUM DISODIUM

**RUGGED WEAR LTD.**  
 NARRAGANSETT, R.I.  
 100% COTTON - COLD WATER WASH  
 NO BLEACH - HANG TO DRY  
 MADE IN U.S.A.

**TV's numbers game**

FOR A decade or so, KGO, KPIX and KRON have been losing prime-time viewers to cable TV independent stations and videocassette recorders. Part of a national trend known as "audience erosion." But the erosion may be ending in the Bay Area — and that's good news for San Francisco's three network TV affiliates. A.C. Nielsen Co. said the three stations captured an average of 68 percent of the viewing audience during prime-time hours (8-11 p.m. Monday through Saturday and 7-11 p.m. Sunday) during the important February ratings period. The figure was identical to that recorded by Nielsen a year ago. Arbitron Ratings Service showed a slight drop, from 69 percent to 67 percent during the year, a difference that may be statistically insignificant. It's good news to the affiliates, of course, because it means the audience is holding steady — and the more people in front of the set, the more advertisers.

**Neo-Synephrine**  
 1/2% NASAL SPRAY

**ORONO**  
 85% ANTRON  
 15% NYLON  
 15% LYCRA  
 SPANDEX  
 SIZE 34  
 MADE IN U.S.A.  
 (CARE OVER)

Area Rug Cleaning  
**20% OFF SALE**

**PRUNE JUICE**  
 A WATER EXTRACT OF DRIED PRUNES

Delicious 100% natural fruit juice with a smooth satisfying taste. Try it as a healthful breakfast juice. Irritating between-meal drink.

**1450 PETS, SUPPLIES & SERVICES**  
 ENGLISH Springer Pups AKC  
 Liv/wml, M & P's \$200, 686-5293  
 GERM Shep. Stud. svc. Exc hips/  
 Isomer. Grandfather Nall Ch  
 '87. Bighine 50% Tucker Hill  
 Germ. \$500 fee. Wille. 661-6039  
 QUALITY!!!!  
 GERMAN Shepherd Pups Pure  
 Bred AKC reg. Champ Sire &  
 Dam. Pets \$350. Show quality

Appliances aren't 10%,  
 they aren't 30%,  
 or even 50%.

**They are 100% of our business**

**30 Year ADJUSTABLE RATE MORTGAGE LOANS**  
 12% LIFETIME CAP

**7.5%** INITIAL RATE  
**9.539%** A.P.R.

80% Loan to Value  
 Up to \$380,000  
 1.5% plus \$200  
 FOR INFORMATION OR APPLICATION

**GALLUP GRAPHICS**

**Favorite Exercise Equipment**  
 American-owned equipment

2% Jogging treadmill  
 7% Trampoline  
 8% Rowing machine  
 Exercise bicycle 21%  
 Weights 26%

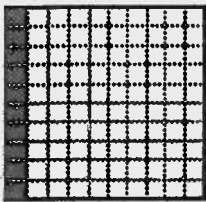
The Final Four semifinal game telecasts were a hit with the viewers. The first game (Sracuse-Providence) registered a 10.7 rating, 22 percent better than last year's Louisville-LSU game. The nightcap (Indiana-UNLV) got a 13.8 rating, up 29 percent over last year's Duke-Kansas telecast.

## Percent Means Hundredths

A fraction with a denominator of 100 is easy to write as a percent. Just write down the numerator of the fraction and follow it with a percent sign. The percent sign means hundredths. (It even looks like a "1" and two "0"s.)

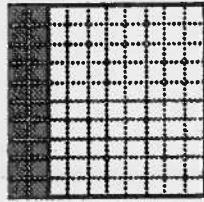
$$\frac{25}{100} = 25\% \quad \text{"25 hundredths = 25 percent"}$$

What part of each large square is shaded? Give each answer as a fraction with denominator 100 and also as a number with a percent sign.



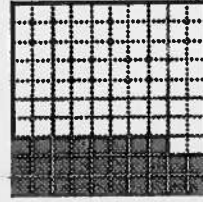
Fraction:  $\frac{10}{100}$

Percent: 10%



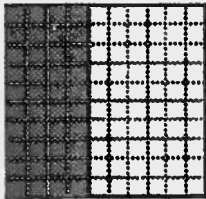
Fraction:

Percent:



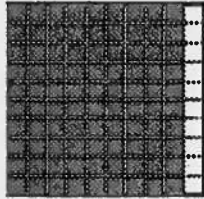
Fraction:

Percent:



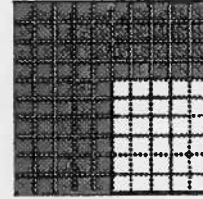
Fraction:

Percent:



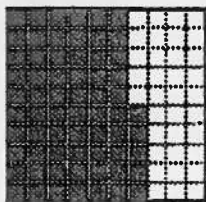
Fraction:

Percent:



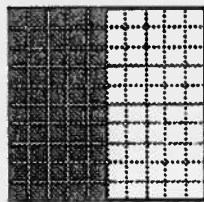
Fraction:

Percent:



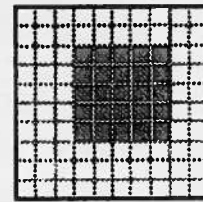
Fraction:

Percent:



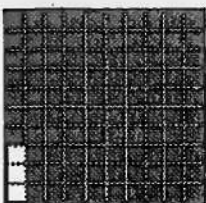
Fraction:

Percent:



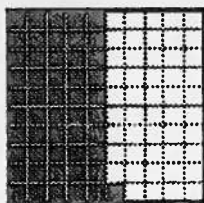
Fraction:

Percent:



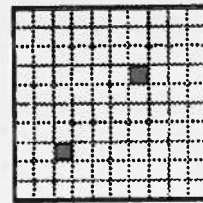
Fraction:

Percent:



Fraction:

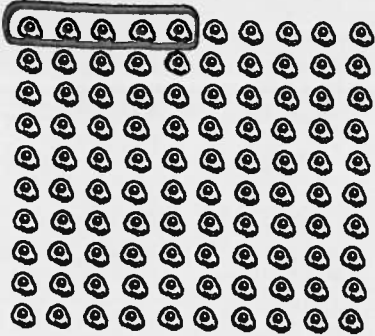
Percent:



Fraction:

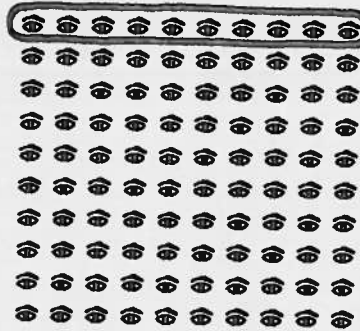
Percent:

What part of each group is circled? Give each answer as a fraction with denominator 100 and as a number with a percent sign.



Fraction:

Percent:



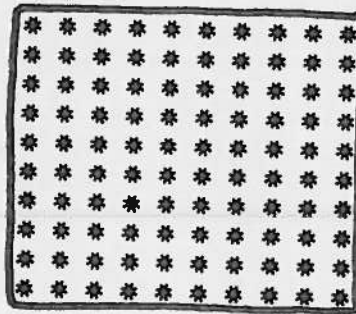
Fraction:

Percent:



Fraction:

Percent:



Fraction:

Percent:

Write each answer in two ways.

Munch bought a box of Fritz crackers. Just before lunch he ate 85 of the 100 crackers in the box. What percent of the crackers did Munch eat?

Fraction:

Percent:

Aran took a math test that had 100 problems. He got 100 problems correct. What percent of the problems did Aran get correct?

Fraction:

Percent:

Anton's teacher gave her class 100 minutes for a math test. Anton took 95 minutes to complete the test. What percent of the time did Anton use?

Fraction:

Percent:

Monica is a quality inspector for a supermarket. She checked a sample of 100 oranges for spoilage. None were spoiled. What percent were spoiled?

Fraction:

Percent:

The word percent comes from the Latin word "centum" which means one hundred. So does the word "cent." A cent is one hundredth of a dollar. Percent means "out of every 100" or "compared to 100" or "per hundred."

50% means { 50 out of every 100  
50 compared to 100  
50 per hundred.

Complete each sentence. Use "out of every 100" or "compared to 100" or "per hundred" and a fraction with 100 as denominator.

12% means: 12 out of every 100 or  $\frac{12}{100}$ .

1% means: \_\_\_\_\_ or \_\_\_\_\_.

18% means: \_\_\_\_\_ or \_\_\_\_\_.

6% means: \_\_\_\_\_ or \_\_\_\_\_.

50% means: \_\_\_\_\_ or \_\_\_\_\_.

98% means: \_\_\_\_\_ or \_\_\_\_\_.

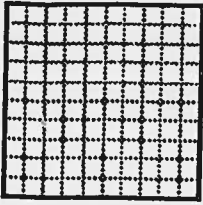
100% means: \_\_\_\_\_ or \_\_\_\_\_.

Write each percent in three ways.

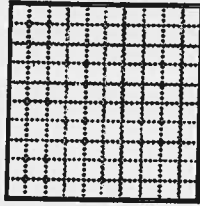
Using words	As a fraction with denominator 100	As a number with a percent sign
36 out of every 100	$\frac{36}{100}$	36%
	$\frac{48}{100}$	
		3%
	$\frac{7}{100}$	
99 compared to 100		
		100%

Each large square below is divided into \_\_\_\_\_ small equal squares.

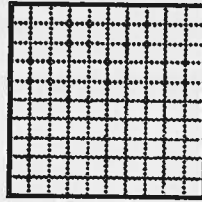
● Shade 25%.



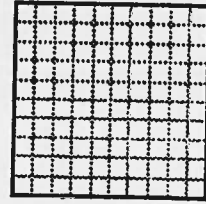
Shade 50%.



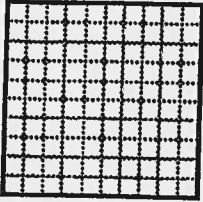
Shade 75%.



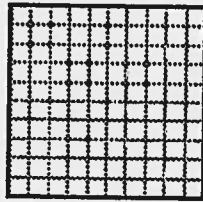
Shade 100%.



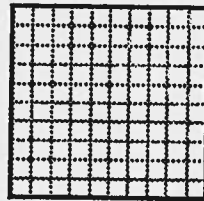
Shade 1%.



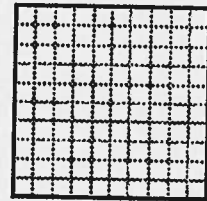
Shade 10%.



Shade 11%.



Shade 99%.



Each group of stars below has \_\_\_\_\_ stars.

Circle 15%.



Circle 60%.

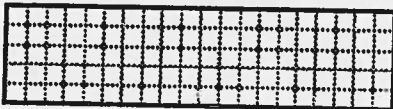


Circle 95%.

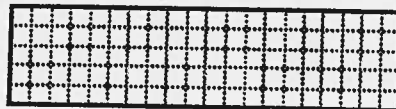


Each rectangle below is divided into \_\_\_\_\_ equal parts.

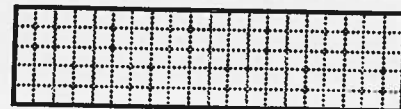
Shade 33%.



Shade 90%.



Shade 0%.



\_\_\_\_\_% is not shaded.

\_\_\_\_\_% is not shaded.

\_\_\_\_\_% is not shaded.

Answer each question using a complete sentence.

90% of the songs played on Station KRAZ are rock and roll. Yesterday afternoon the DJ played 100 songs. How many were rock and roll?

● \_\_\_\_\_ songs were rock and roll.

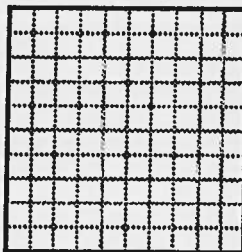
Sui bought a sheet of 100 postage stamps. She used 82% of them to mail greeting cards. How many stamps did she have left?

## All and None as Percents

Shade all of the square.

What percent of the square is shaded? \_\_\_\_\_%

All of something is \_\_\_\_\_% of it.

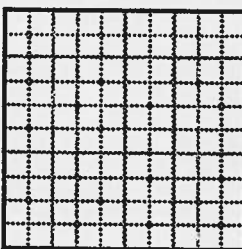


$$1 = \underline{\hspace{2cm}}\%$$

Shade none of the square.

What percent of the square is shaded? \_\_\_\_\_%

None of something is \_\_\_\_\_% of it.

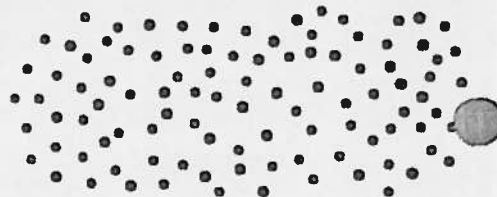
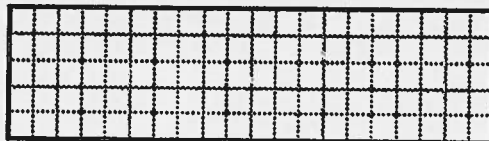
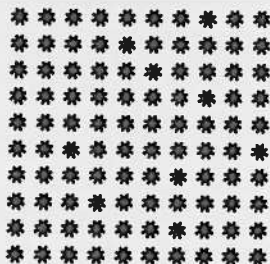


$$0 = \underline{\hspace{2cm}}\%$$

Circle all of the stars.

Shade 100%.

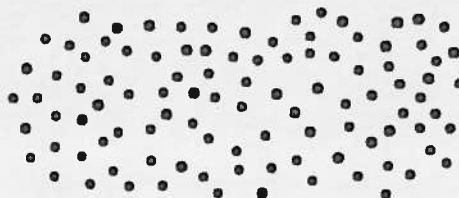
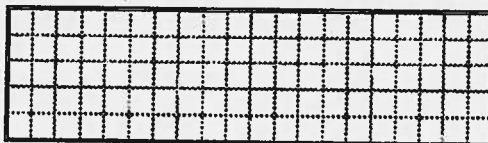
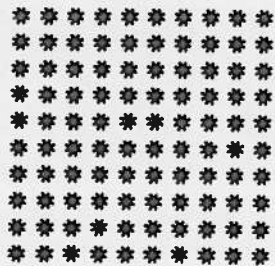
Circle 100% of the dots.



Circle none of the stars.

Shade 0%.

Circle 0% of the dots.



Answer each question using a complete sentence.

On the day of the Mr. Mean's class picnic, everyone came to school. What percent of the class was present?

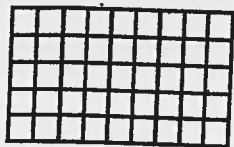
\_\_\_\_% of the class was present.

On the next day Mr. Mean gave a math test. No one showed up. What percent of the class was present?



You can use 100% and 0% even when you can't divide something into hundredths. 0% of any number is zero (none of it). 100% of any number is the number (all of it).

Shade 100%.



Shade 0%.



Shade 100%.



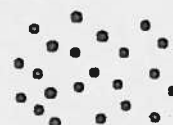
Circle 0%.



Circle 100%.



Circle 0%.



0% of 8 is 0.

0% of 25 is \_\_\_\_\_.

0% of 99 is \_\_\_\_\_.

100% of 8 is 8.

100% of 25 is \_\_\_\_\_.

100% of 99 is \_\_\_\_\_.

\_\_\_\_\_ is 100% of 12.

0% of 32 is \_\_\_\_\_.

\_\_\_\_\_ is 0% of 64.

0 is \_\_\_\_\_% of 16.

84 is \_\_\_\_\_% of 84.

\_\_\_\_\_ % of 1320 is 1320.

35 is 100% of \_\_\_\_\_.

0 is 100% of \_\_\_\_\_.

0 is 0% of \_\_\_\_\_.

Use 0% and 100% with amounts of money just as you did with numbers.

0% of \$50 is \$0.

100% of \$18.50 is \_\_\_\_\_.

100% of \$100 is \_\_\_\_\_.

\_\_\_\_\_ is 0% of \$5.

100% of \$1 is \_\_\_\_\_.

\_\_\_\_\_ is 100% of 25¢.

Answer each question using a complete sentence.

Bill had 30 minutes to complete his math test. He used 100% of his time. How long did he spend on his test?

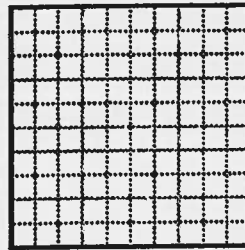
He spent \_\_\_\_\_ minutes on his test.

The Stingy Pay Plant workers earn \$6.50 per hour. The owner offered them a 0% raise. How much per hour was the raise?

# One Half and One Fourth as Percents

Shade one half of the square.

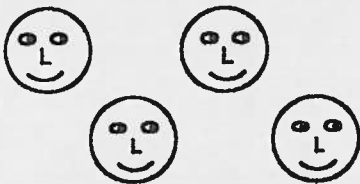
What percent of the square is shaded? \_\_\_\_\_%



One half of something is \_\_\_\_\_% of it.

$$\frac{1}{2} = \text{_____}\%$$

Put hair on half the heads.  
Put ears on 50% of the heads.



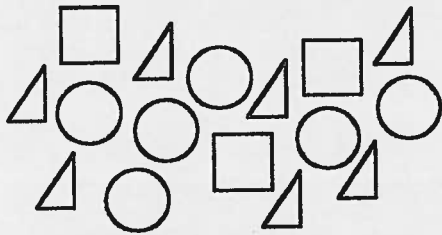
Circle 50% of the dollar.



Put X's in 50% of the squares.  
Shade 50% of the squares.



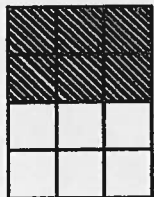
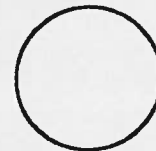
Shade 50% of the shapes.



Circle half of the stars.



Shade about 50% of the circle.

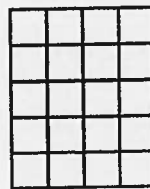


How many squares? 12

Shade 50%.

How many shaded? 6

50% of 12 is 6.

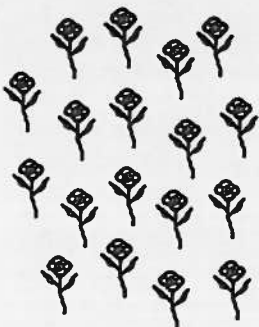


How many squares? \_\_\_\_\_

Shade 50%.

How many shaded? \_\_\_\_\_

50% of \_\_\_\_\_ is \_\_\_\_\_.



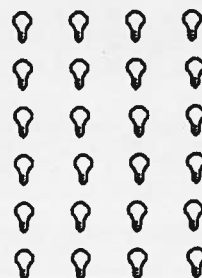
How many flowers? \_\_\_\_\_

Circle 50%.

How many circled? \_\_\_\_\_

$\frac{1}{2}$  of \_\_\_\_\_ is \_\_\_\_\_.

50% of \_\_\_\_\_ is \_\_\_\_\_.



How many bulbs? \_\_\_\_\_

Circle 50%.

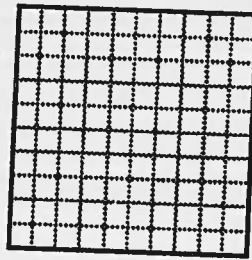
How many circled? \_\_\_\_\_

$\frac{1}{2}$  of \_\_\_\_\_ is \_\_\_\_\_.

50% of \_\_\_\_\_ is \_\_\_\_\_.

Shade one fourth of the square.

What percent of the square is shaded? \_\_\_\_\_%



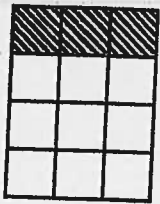
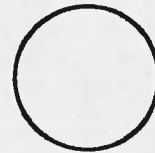
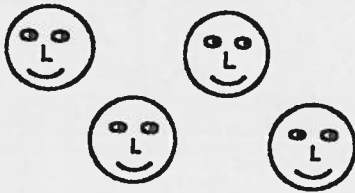
One fourth of something is \_\_\_\_\_% of it.

$$\frac{1}{4} = \text{_____}\%$$

Put hair on 25% of the heads.  
Put ears on 100% of the heads.

Circle 25% of the stars.

Shade about 25% of the circle.

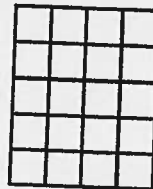


How many squares? 12

Shade 25%.

How many shaded? \_\_\_\_\_

25% of \_\_\_\_\_ is \_\_\_\_\_.



How many squares? \_\_\_\_\_

Shade 25%.

How many shaded? \_\_\_\_\_

25% of \_\_\_\_\_ is \_\_\_\_\_.



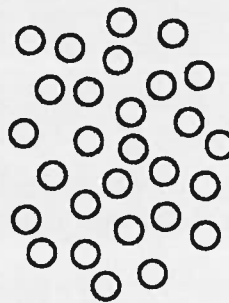
How many stars? \_\_\_\_\_

Circle 25%.

How many circled? \_\_\_\_\_

$\frac{1}{4}$  of \_\_\_\_\_ is \_\_\_\_\_.

25% of \_\_\_\_\_ is \_\_\_\_\_.



How many circles? \_\_\_\_\_

Shade 25%.

How many shaded? \_\_\_\_\_

$\frac{1}{4}$  of \_\_\_\_\_ is \_\_\_\_\_.

25% of \_\_\_\_\_ is \_\_\_\_\_.

Try these without pictures to help.

$\frac{1}{2}$  of 28 is 14.

50% of 28 is 14.

$\frac{1}{4}$  of 28 is \_\_\_\_\_.

25% of 28 is \_\_\_\_\_.

$\frac{1}{2}$  of 36 is \_\_\_\_\_.

\_\_\_\_\_ % of 36 is 18.

$\frac{1}{4}$  of 36 is \_\_\_\_\_.

\_\_\_\_\_ % of 36 is 9.

Since  $50\% = \frac{1}{2}$  and  $25\% = \frac{1}{4}$ , there is an easy way to find 50% and 25% of a number.

To find 50% of a number, simply divide by 2.  
 To find 25% of a number, simply divide by 4.

Use division to fill in the chart below.

100%	32	80	200	24¢	\$1.80	\$12.40	\$104
50%	16						
25%	8						

Use division to solve each problem below.

50% of 40 is           . 40 ÷ 2      50% of \$44 is           .      50% of \$9.00 is           .  
 25% of 40 is           . 40 ÷ 4      25% of \$44 is           .      25% of \$9.00 is           .

6 is 50% of           .                 is 25% of 48.                 is 25% of \$20.

6 is           % of 12.      12 is           % of 48.      \$5 is           % of \$20.

           is 50% of 12.      12 is 25% of           .      \$5 is 25% of           .

9 is           % of 18.                 is 50% of 30.      3 is 50% of           .

2 is           % of 8.                 is 25% of 36.      10 is 50% of           .

\$1 is           % of \$2.                 is 25% of \$64.      \$7 is 25% of           .

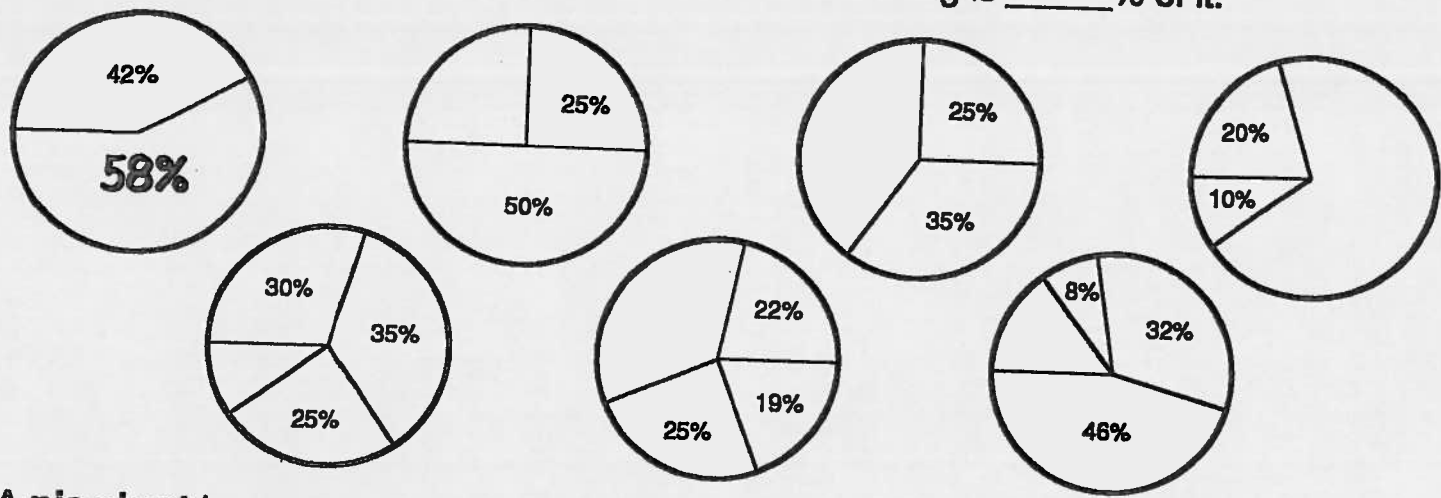
Be careful on the ones below! They're trickier.

\$1.50 is           % of \$3.                 is 25% of \$8.00.      \$3.50 is 25% of           .

\$14.25 is 50% of           .                 is 25% of \$5.00.                 is 25% of \$42.00.

# 100% Makes It All

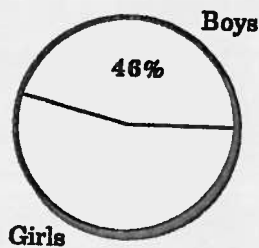
Fill in each missing percent. Remember, all of something is \_\_\_\_\_% of it.



A pie chart is one useful way to show information. A pie chart is made with a circle divided into slices of "pie." The complete circle is 100%.

Fill in the missing percent in each pie chart below. Then use the pie chart to help answer the question.

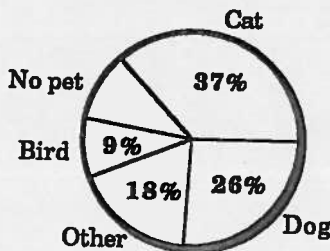
**Students at Cabot High School**



What percent of the students at Cabot High are girls?

\_\_\_\_\_

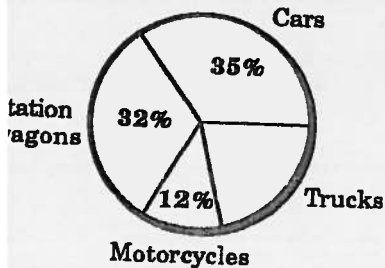
**Favorite Pet of 7th Graders**



What percent of the seventh graders chose no pet?

\_\_\_\_\_

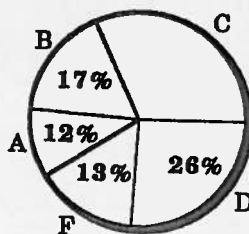
**Motor Vehicles at the Stadium Lot**



Trucks and cars make up what percent of the vehicles?

\_\_\_\_\_

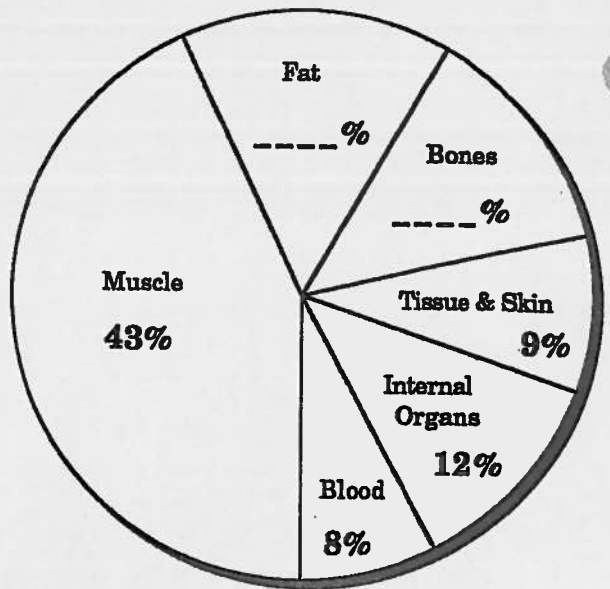
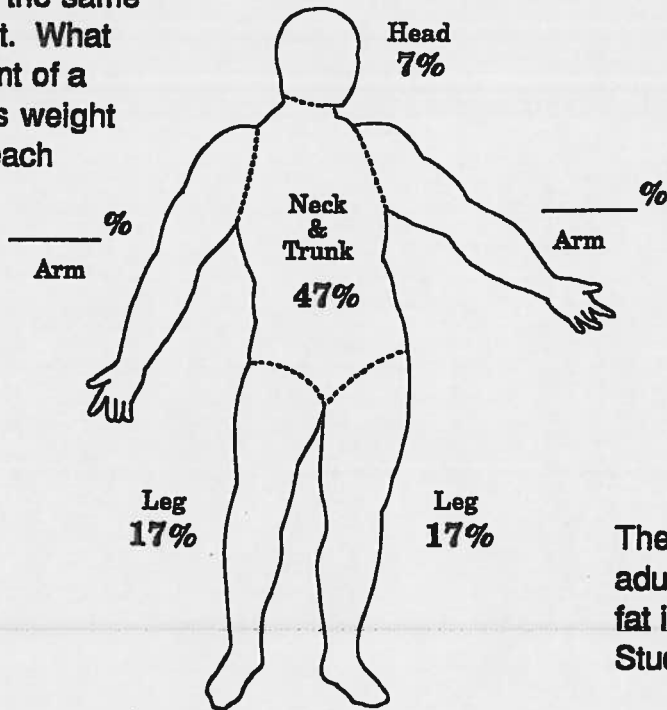
**Math Test Results**



What percent of the students got higher than a D on the test?

\_\_\_\_\_

The diagram shows how body weight is divided between the body parts in the average adult in the U.S. Each arm is about the same weight. What percent of a body's weight is in each arm?



The pie chart shows what the average adult in the U.S. is made of. The weight of fat is about equal to the weight of bones. Study the chart and finish it.

**Big Sale!**  
20% off

What percent of the regular price is taken off? \_\_\_\_\_

What percent of the regular price do you pay? \_\_\_\_\_

**10% Real Fruit Juice**

What percent of the drink is fruit juice? \_\_\_\_\_

What percent is not juice? \_\_\_\_\_  
What is it? \_\_\_\_\_

**35% COTTON**

What percent of the fabric is cotton? \_\_\_\_\_

What percent is not cotton? \_\_\_\_\_

**100% Natural**

What percent of the food is natural? \_\_\_\_\_

What percent is not natural? \_\_\_\_\_

A weather forecaster says there is a 20% chance of rain. What is the chance that it will not rain? \_\_\_\_\_ Would you take an umbrella if you went out? \_\_\_\_\_

Marie got 8% of the problems on her math test wrong and she left 6% more undone. What percent did she get correct? \_\_\_\_\_

## Floor Plans

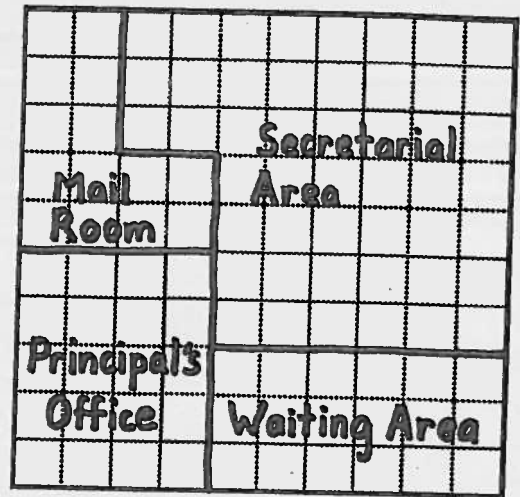
Ramona Rodriguez is an architect. She has designed 100 square meters of new office space for a high school. Look at her plan. Use it to answer each question below.

The mail room is \_\_\_\_\_% of the area.

The principal's office takes up \_\_\_\_\_% of the space.

The secretarial area occupies \_\_\_\_\_% of the space.

\_\_\_\_\_% of the office is taken up by the waiting area.



Now it's your turn to be the architect. You have been hired by a school to design a new art studio. The studio will be 100 square meters. Draw walls and label the areas using the guidelines below.

6% of the area is the teacher's office.

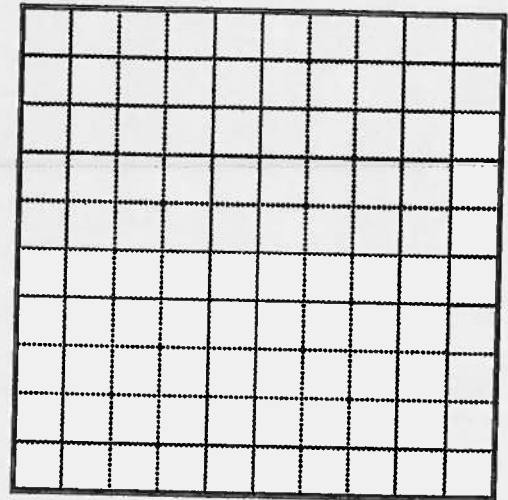
6% is a storage room.

21% is a ceramics area.

9% is a kiln room.

The rest is the classroom.

What percent is classroom? \_\_\_\_\_%



You did so well designing the school building that you've been hired by the principal to plan a new summer cottage for his family. The cottage will be 100 square meters (including the porch). Make a floor plan for the cottage.

22% of the area is living room.

Two bedrooms each occupy 15%.

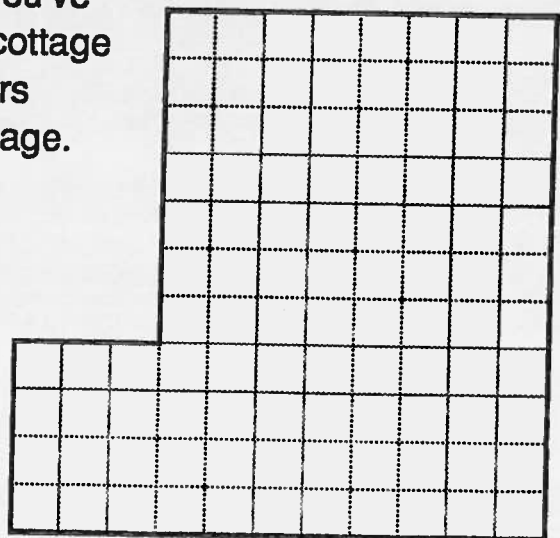
20% is kitchen.

6% is bathroom.

12% is porch.

The rest is hall and storage area.

What percent is hall and storage? \_\_\_\_\_%



## Recommended Daily Allowances (RDA) of Vitamins

Nutrition Information Per Serving		
Serving Size: 1 Oz. (About 1/4 Cup) (28.35 g) Servings Per Package: 24		
	1 Oz. (28.35 g) Cereal	With 1/2 Cup (118 mL) Fortified Whole Milk
Calories	110	180*
Protein	3 g	7 g
Carbohydrate	23 g	29 g
Fat	0	4 g
Sodium	180 mg	250 mg
Percentages of U.S. Recommended Daily Allowances (U.S. RDA)		
Protein	4%	10%
Vitamin A	25%	30%
Vitamin C	**	**
Thiamine	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Calcium	**	15%
Iron	15%	15%
Vitamin D	10%	25%
Vitamin B <sub>6</sub>	25%	30%
Folic Acid	25%	25%
Vitamin B <sub>12</sub>	25%	30%
Phosphorus	6%	15%
Magnesium	6%	10%
Zinc	8%	10%
Copper	6%	6%

\*Save 30 calories - use skim milk.  
\*\*Contains less than 2% of the U.S. RDA of these nutrients.

This label is from a box of breakfast cereal. It tells about the amounts of vitamins and minerals in a one ounce serving of cereal. The amounts are given as percentages of the Recommended Daily Allowance (RDA) of each vitamin and mineral.

The left column gives the percentages in one ounce of cereal alone. The right column gives the percentages in one ounce of cereal with one half cup of milk.

Use the information to complete the tables below.

Nutrient	1 ounce serving of cereal	Cereal with half cup milk
Protein	4%	10%
Vitamin A		
Niacin		

Nutrient	1 ounce serving of cereal	Cereal with half cup milk
Vitamin D		
Zinc		
Copper		

What percent of the RDA of protein do you get in  $\frac{1}{2}$  cup of milk alone? \_\_\_\_\_

10% - 4%

What percent of the RDA of vitamin D do you get in  $\frac{1}{2}$  cup of milk alone? \_\_\_\_\_

What percent of the RDA of copper do you get in  $\frac{1}{2}$  cup of milk alone? \_\_\_\_\_

What percent of the RDA of protein do you still need after you've eaten one serving of cereal alone? \_\_\_\_\_

What percent of the RDA of vitamin A do you still need after you've eaten one serving of cereal with milk? \_\_\_\_\_

How many servings of cereal would you need to eat to get 100% of the RDA of niacin? \_\_\_\_\_

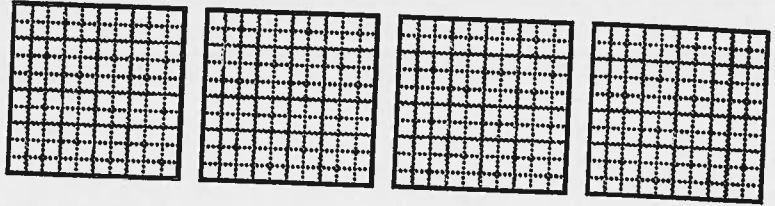


## Double and Triple as Percents

Shade 100% of a square.

Shade another 100% of a square.

All together you shaded \_\_\_\_\_% of a square.



All together you shaded \_\_\_\_\_ squares.

Two of something is \_\_\_\_\_% of it.

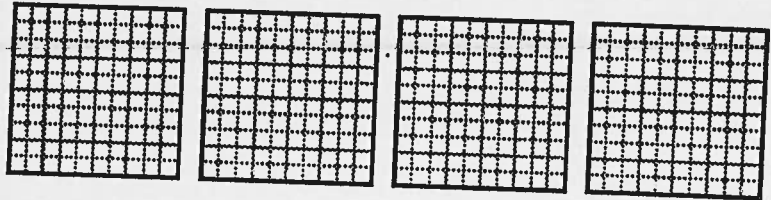
$$2 = \underline{\hspace{2cm}}\%$$

Shade 100% of a square.

Shade a second 100% of a square.

Shade a third 100% of a square.

All together you shaded \_\_\_\_\_% of a square.

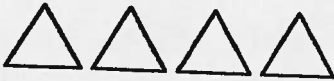


All together you shaded \_\_\_\_\_ squares.

Three of something is \_\_\_\_\_% of it.

$$3 = \underline{\hspace{2cm}}\%$$

Shade 200% of a triangle.



Shade 300% of a circle.



Shade 400% of a square.



100% of 6 is \_\_\_\_\_.

200% of 6 is \_\_\_\_\_.

300% of 6 is \_\_\_\_\_.

100% of 15 is \_\_\_\_\_.

200% of 15 is \_\_\_\_\_.

300% of 15 is \_\_\_\_\_.

\_\_\_\_\_ is 200% of 8.

\_\_\_\_\_ is 300% of 8.

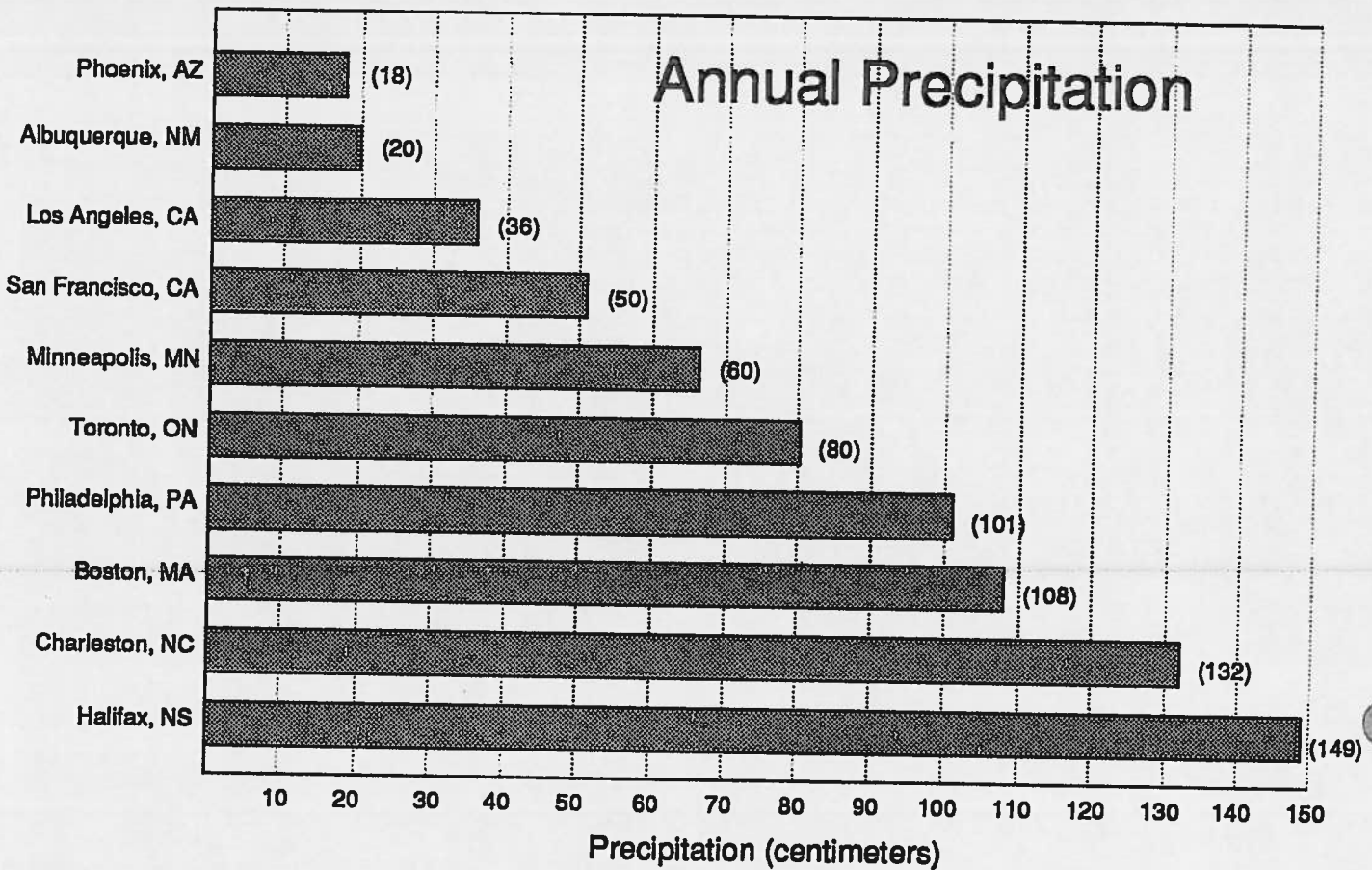
\_\_\_\_\_ is 400% of 8.

32 is \_\_\_\_\_% of 16.

50 is \_\_\_\_\_% of 25.

27 is \_\_\_\_\_% of 9.

Below is a graph of the average annual precipitation (rain and melted snow) for 10 cities in North America. The actual precipitation is given at the end of each bar in the graph.



- Which city has 200% of the precipitation of Phoenix? \_\_\_\_\_
- Which city has 300% of the precipitation of Los Angeles? \_\_\_\_\_
- Which city has 400% of the precipitation of Albuquerque? \_\_\_\_\_
- Which city has 600% of the precipitation of Phoenix? \_\_\_\_\_
- Which city has 250% of the precipitation of Albuquerque? \_\_\_\_\_
- Which city has about 300% of the precipitation of San Francisco? \_\_\_\_\_
- Which city has about 400% of the precipitation of Los Angeles? \_\_\_\_\_
- Which city has about 500% of the precipitation of Albuquerque? \_\_\_\_\_
- Which city has about 250% of the precipitation of Minneapolis? \_\_\_\_\_
- Which city has about 750% of the precipitation of Albuquerque? \_\_\_\_\_

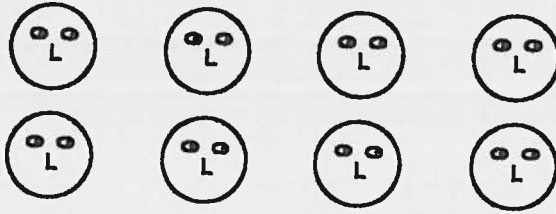
## Practice with Percents

Draw hats on 50% of the heads.

Put smiles on 100% of the heads.

Give 25% of the heads ears.

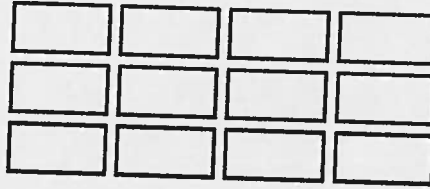
Paint 0% of the heads blue.



Shade 25% of all the rectangles.

Put an X inside 50%.

Make a ring around 100%.



Show how much each person earns per hour.

Sally earns \$6.00 per hour.

Sally:

Ted earns 200% of Sally's pay.

Ted: \$ \_\_\_\_\_

Ora earns 300% of Sally's pay.

Ora: \$ \_\_\_\_\_

Alisa earns 50% of Sally's pay.

Alisa: \$ \_\_\_\_\_

Joan earns 200% of Ted's pay.

Joan: \$ \_\_\_\_\_

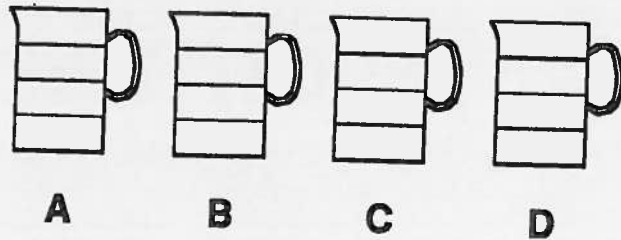
How full should each cup be? Shade the cups to show your answer.

Cup A is 25% full.

Cup B has 200% as much as cup A.

Cup C has 50% as much as cup B.

Cup D has 300% as much as cup A.



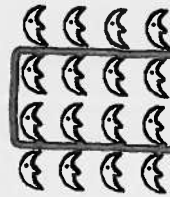
What percent of the things in each group are circled? What percent are not circled?



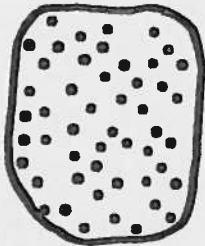
\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled



\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled



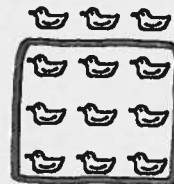
\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled



\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled



\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled



\_\_\_\_\_ %  
circled  
\_\_\_\_\_ %  
not circled

What percent of each square is shaded?



\_\_\_\_\_ %  
is shaded.



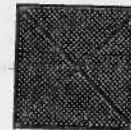
\_\_\_\_\_ %  
is shaded.



\_\_\_\_\_ %  
is shaded.



\_\_\_\_\_ %  
is shaded.



\_\_\_\_\_ %  
is shaded.

Answer each question using a complete percent statement.

Problem: What is 50% of \$24?

Statement: **\$12 is 50% of \$24.**

Problem: What is 100% of \$17?

Statement:

Problem: What is 200% of \$12?

Statement:

Problem: What is 50% of \$5?

Statement:

Problem: What is 25% of \$12?

Statement:

Problem: What is 50% of \$2.50?

Statement:

Problem: What is 200% of \$6.75?

Statement:

Problem: What is 25% of \$5?

Statement:

Draw each line segment.

$\overline{AB}$

50% as long as  $\overline{AB}$

25% as long as  $\overline{AB}$

$\overline{CD}$

25% as long as  $\overline{CD}$

100% as long as  $\overline{CD}$

$\overline{EF}$

100% as long as  $\overline{EF}$

200% as long as  $\overline{EF}$

$\overline{GH}$

50% as long as  $\overline{GH}$

200% as long as  $\overline{GH}$

$\overline{IJ}$

200% as long as  $\overline{IJ}$

300% as long as  $\overline{IJ}$

$\overline{KL}$

50% as long as  $\overline{KL}$

100% as long as  $\overline{KL}$

150% as long as  $\overline{KL}$

0% as long as  $\overline{KL}$

$\overline{MN}$

25% as long as  $\overline{MN}$

50% as long as  $\overline{MN}$

75% as long as  $\overline{MN}$

100% as long as  $\overline{MN}$

0% of 60 is \_\_\_\_\_.

25% of 60 is \_\_\_\_\_.

50% of 60 is \_\_\_\_\_.

100% of 60 is \_\_\_\_\_.

25% of 44 is \_\_\_\_\_.

50% of 44 is \_\_\_\_\_.

75% of 44 is \_\_\_\_\_.

100% of 44 is \_\_\_\_\_.

0% of \$21 is \_\_\_\_\_.

100% of \$21 is \_\_\_\_\_.

200% of \$21 is \_\_\_\_\_.

300% of \$21 is \_\_\_\_\_.

\_\_\_\_\_ is 0% of 320.

\_\_\_\_\_ is 25% of 320.

\_\_\_\_\_ is 50% of 320.

\_\_\_\_\_ is 100% of 320.

\_\_\_\_\_ is 25% of 140.

\_\_\_\_\_ is 50% of 140.

\_\_\_\_\_ is 75% of 140.

\_\_\_\_\_ is 100% of 140.

\_\_\_\_\_ is 0% of \$85.

\_\_\_\_\_ is 100% of \$85.

\_\_\_\_\_ is 200% of \$85.

\_\_\_\_\_ is 300% of \$85.

300% of \$5 is \_\_\_\_\_.

\_\_\_\_\_ is 0% of \$200.

300% of \$27 is \_\_\_\_\_.

\_\_\_\_\_ is 50% of \$220.

100% of 36492 is \_\_\_\_\_.

50% of 222222 is \_\_\_\_\_.

0% of 1123456789 is \_\_\_\_\_.

100% of \$6.35 is \_\_\_\_\_.

0% of 43621 is \_\_\_\_\_.

100% of 9312 is \_\_\_\_\_.

300% of 11111 is \_\_\_\_\_.

0% of \$1835.25 is \_\_\_\_\_.

50% of \$25 is \$12.50.

$\frac{1}{2}$  of \$25

\_\_\_\_\_ is 50% of \$21.

50% of \$19 is \_\_\_\_\_.

$\frac{1}{2}$  of \$19

\_\_\_\_\_ is 50% of \$7.

25% of \$30 is \_\_\_\_\_.

$\frac{1}{4}$  of \$30

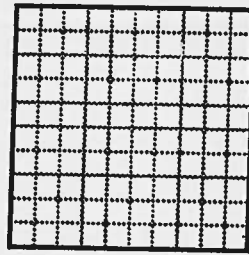
\_\_\_\_\_ is 25% of \$50.

## One Tenth as a Percent

Shade ten small squares.

What percent of the large square is shaded? \_\_\_\_\_%

You shaded  $\frac{10}{100}$  or  $\frac{1}{10}$  of the large square.



One tenth of something is \_\_\_\_\_% of it.

$$\frac{1}{10} = \text{_____}\%$$

To find 10% of a number, simply divide by 10.

$\frac{1}{10}$ of 50 is _____. <span style="border: 1px solid black; border-radius: 50%; padding: 2px; font-size: small;">50÷10</span>	10% of 50 is _____.	$\frac{1}{10}$ of 20 is _____. <span style="border: 1px solid black; border-radius: 50%; padding: 2px; font-size: small;">20÷10</span>	10% of 20 is _____.
--	---------------------	--	---------------------

$\frac{1}{10}$ of 900 is _____.	10% of 900 is _____.	$\frac{1}{10}$ of 40 is _____.	10% of 40 is _____.
---------------------------------	----------------------	--------------------------------	---------------------

Dividing by 10 is easy when the number you're dividing ends in zero. You don't need pencil and paper. Simply drop the last zero.

30

100% is \_\_\_\_\_.

10% is \_\_\_\_\_.

70

100% is \_\_\_\_\_.

10% is \_\_\_\_\_.

120

100% is \_\_\_\_\_.

10% is \_\_\_\_\_.

300

100% is \_\_\_\_\_.

10% is \_\_\_\_\_.

10% of 10 is 1.

10% of 60 is \_\_\_\_\_.

10% of \$750 is \_\_\_\_\_.

10% of 20 is \_\_\_\_\_.

10% of 120 is \_\_\_\_\_.

10% of \$1500 is \_\_\_\_\_.

10% of 30 is \_\_\_\_\_.

10% of 180 is \_\_\_\_\_.

10% of \$2250 is \_\_\_\_\_.

10% of 40 is \_\_\_\_\_.

10% of 240 is \_\_\_\_\_.

10% of \$3000 is \_\_\_\_\_.

\_\_\_\_\_ is 10% of 80.

\_\_\_\_\_ is 10% of 390.

\_\_\_\_\_ is 10% of 4560.

5 is 10% of \_\_\_\_\_.

48 is 10% of \_\_\_\_\_.

125 is 10% of \_\_\_\_\_.

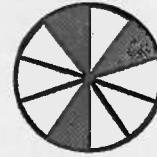
Each pie chart has been divided into equal parts. What percent is shaded? What percent is not shaded?



\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded



\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded



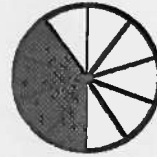
\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded



\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded



\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded



\_\_\_\_\_ %  
shaded  
\_\_\_\_\_ %  
not shaded

If you know 10% of a number, you can easily find 20%, 30%, or 40% of the number.

10% of 90 is 9.

10% of 300 is \_\_\_\_\_.

20% of 90 is 18.

$2 \times 9$

20% of 300 is \_\_\_\_\_.

30% of 90 is \_\_\_\_\_.

$3 \times \underline{\quad}$

30% of 300 is \_\_\_\_\_.

40% of 90 is \_\_\_\_\_.

$\underline{\quad} \times \underline{\quad}$

40% of 300 is \_\_\_\_\_.

50% of 90 is \_\_\_\_\_.

50% of 300 is \_\_\_\_\_.

60% of 90 is \_\_\_\_\_.

60% of 300 is \_\_\_\_\_.

70% of 90 is \_\_\_\_\_.

70% of 300 is \_\_\_\_\_.

80% of 90 is \_\_\_\_\_.

80% of 300 is \_\_\_\_\_.

90% of 90 is \_\_\_\_\_.

90% of 300 is \_\_\_\_\_.

100% of 90 is \_\_\_\_\_.

100% of 300 is \_\_\_\_\_.

110% of 90 is \_\_\_\_\_.

110% of 300 is \_\_\_\_\_.

120% of 90 is \_\_\_\_\_.

120% of 300 is \_\_\_\_\_.

\_\_\_\_\_ is 10% of \$50.

10% of 240 is \_\_\_\_\_.

10% of 400 is \_\_\_\_\_.

\_\_\_\_\_ is 20% of \$50.

20% of 240 is \_\_\_\_\_.

20% of 400 is \_\_\_\_\_.

\_\_\_\_\_ is 30% of \$50.

30% of 240 is \_\_\_\_\_.

30% of 400 is \_\_\_\_\_.

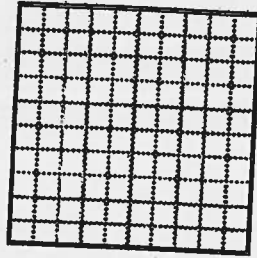


# One Hundredth as a Percent

Shade one small square.

What percent of the large square is shaded? \_\_\_\_\_%

You shaded  $\frac{1}{100}$  of the large square.



One hundredth of something is \_\_\_\_\_% of it.

$$\frac{1}{100} = \text{_____}\%$$

To find 1% of a number, simply divide by 100.

$\frac{1}{100}$  of 300 is \_\_\_\_\_. 300 ÷ 100 1% of 300 is \_\_\_\_\_.

$\frac{1}{100}$  of 500 is \_\_\_\_\_. 500 ÷ 100 1% of 500 is \_\_\_\_\_.

$\frac{1}{100}$  of 700 is \_\_\_\_\_. 1% of 700 is \_\_\_\_\_.

$\frac{1}{100}$  of 900 is \_\_\_\_\_. 1% of 900 is \_\_\_\_\_.

Dividing by 100 is easy when the number you're dividing ends in two zeros. Simply drop the last two zeros.

300

100% is \_\_\_\_\_.

1% is \_\_\_\_\_.

700

100% is \_\_\_\_\_.

1% is \_\_\_\_\_.

1200

100% is \_\_\_\_\_.

1% is \_\_\_\_\_.

3000

100% is \_\_\_\_\_.

1% is \_\_\_\_\_.

1% of 100 is \_\_\_\_\_.

1% of 400 is \_\_\_\_\_.

1% of \$2300 is \_\_\_\_\_.

1% of 200 is \_\_\_\_\_.

1% of 800 is \_\_\_\_\_.

1% of \$4600 is \_\_\_\_\_.

1% of 300 is \_\_\_\_\_.

1% of 1200 is \_\_\_\_\_.

1% of \$6900 is \_\_\_\_\_.

1% of 400 is \_\_\_\_\_.

1% of 1600 is \_\_\_\_\_.

1% of \$9200 is \_\_\_\_\_.

\_\_\_\_\_ is 1% of 900.

\_\_\_\_\_ is 1% of 3900.

\_\_\_\_\_ is 1% of 9900.

5 is 1% of \_\_\_\_\_.

48 is 1% of \_\_\_\_\_.

125 is 1% of \_\_\_\_\_.

If you know 1% of a number, you can easily find 2%, 3%, or 4% of the number.

1% of 600 is 6.

2% of 600 is \_\_\_\_\_ 2x6

3% of 600 is \_\_\_\_\_ x6

4% of 600 is \_\_\_\_\_.

5% of 600 is \_\_\_\_\_.

6% of 600 is \_\_\_\_\_.

1% of 1200 is \_\_\_\_\_.

2% of 1200 is \_\_\_\_\_.

3% of 1200 is \_\_\_\_\_.

4% of 1200 is \_\_\_\_\_.

5% of 1200 is \_\_\_\_\_.

6% of 1200 is \_\_\_\_\_.

\_\_\_\_\_ is 1% of 900.

\_\_\_\_\_ is 2% of 900.

\_\_\_\_\_ is 3% of 900.

\_\_\_\_\_ is 4% of 900.

\_\_\_\_\_ is 5% of 900.

\_\_\_\_\_ is 6% of 900.

\_\_\_\_\_ is 7% of 900.

\_\_\_\_\_ is 8% of 900.

\_\_\_\_\_ is 9% of 900.

\_\_\_\_\_ is 10% of 900.

1% of 1500 is \_\_\_\_\_.

2% of 1500 is \_\_\_\_\_.

3% of 1500 is \_\_\_\_\_.

4% of 1500 is \_\_\_\_\_.

5% of 1500 is \_\_\_\_\_.

6% of 1500 is \_\_\_\_\_.

7% of 1500 is \_\_\_\_\_.

8% of 1500 is \_\_\_\_\_.

9% of 1500 is \_\_\_\_\_.

10% of 1500 is \_\_\_\_\_.

1% of \$7500 is \_\_\_\_\_.

2% of \$7500 is \_\_\_\_\_.

3% of \$7500 is \_\_\_\_\_.

4% of \$7500 is \_\_\_\_\_.

5% of \$7500 is \_\_\_\_\_.

6% of \$7500 is \_\_\_\_\_.

7% of \$7500 is \_\_\_\_\_.

8% of \$7500 is \_\_\_\_\_.

9% of \$7500 is \_\_\_\_\_.

10% of \$7500 is \_\_\_\_\_.

Each group of problems has a pattern. Finding the pattern can help you get the answer quickly.

100%	200		
1%	2	5	
2%	4		
4%			100
8%			
16%			

100%	600		
1%		8	
3%			
9%			
27%			
81%			162

100%			1100
1%	3		
5%			
10%		70	
50%			

## Practice with 1% and 10%

600  
 100% is \_\_\_\_\_.  
 10% is \_\_\_\_\_.  
 1% is \_\_\_\_\_.

400  
 100% is \_\_\_\_\_.  
 10% is \_\_\_\_\_.  
 1% is \_\_\_\_\_.

1700  
 100% is \_\_\_\_\_.  
 10% is \_\_\_\_\_.  
 1% is \_\_\_\_\_.

7000  
 100% is \_\_\_\_\_.  
 10% is \_\_\_\_\_.  
 1% is \_\_\_\_\_.

900  
 100% is \_\_\_\_\_.  
 \_\_\_\_\_% is 90.  
 1% is \_\_\_\_\_.

500  
 \_\_\_\_\_% is 500.  
 10% is \_\_\_\_\_.  
 1% is \_\_\_\_\_.

\_\_\_\_\_   
 100% is 4100.  
 \_\_\_\_\_% is 410.  
 \_\_\_\_\_% is 41.

\_\_\_\_\_   
 100% is \_\_\_\_\_.  
 10% is 500.  
 1% is \_\_\_\_\_.

100% of 200 is \_\_\_\_\_.

100% of 1300 is \_\_\_\_\_.

100% of \$5400 is \_\_\_\_\_.

10% of 200 is \_\_\_\_\_.

10% of 1300 is \_\_\_\_\_.

10% of \$5400 is \_\_\_\_\_.

1% of 200 is \_\_\_\_\_.

1% of 1300 is \_\_\_\_\_.

1% of \$5400 is \_\_\_\_\_.

\_\_\_\_\_ is 10% of 60.

\_\_\_\_\_ is 10% of 190.

\_\_\_\_\_ is 10% of \$730.

\_\_\_\_\_ is 1% of 600.

\_\_\_\_\_ is 1% of 1900.

\_\_\_\_\_ is 1% of \$7300.

4 is \_\_\_\_\_% of 4.

2 is \_\_\_\_\_% of 200.

\$50 is \_\_\_\_\_% of \$5000.

4 is \_\_\_\_\_% of 40.

2 is \_\_\_\_\_% of 2.

\$50 is \_\_\_\_\_% of \$500.

4 is \_\_\_\_\_% of 400.

2 is \_\_\_\_\_% of 20.

\$50 is \_\_\_\_\_% of \$50.

Make up some problem sets of your own.

1% of \_\_\_\_\_ is \_\_\_\_\_.

1% of \_\_\_\_\_ is \_\_\_\_\_.

1% of \_\_\_\_\_ is \_\_\_\_\_.

10% of \_\_\_\_\_ is \_\_\_\_\_.

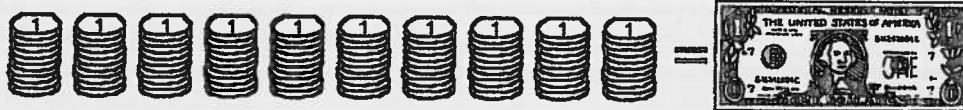
10% of \_\_\_\_\_ is \_\_\_\_\_.

10% of \_\_\_\_\_ is \_\_\_\_\_.

100% of \_\_\_\_\_ is \_\_\_\_\_.

100% of \_\_\_\_\_ is \_\_\_\_\_.

100% of \_\_\_\_\_ is \_\_\_\_\_.



100¢ = \$1.00

One hundred cents equals one dollar.

100¢  
10¢  
10% of \$1.00 = \$.10

100¢  
1¢  
1% of \$1.00 = \$.01

Finding 10% or 1% of dollar amounts can be confusing when the amount is expressed as a decimal. It helps to think of the amount as all cents.

True or false?

90¢  
9¢  
10% of \$.90 is \$.09

True  False

300¢  
3¢  
10% of \$3.00 is \$.03

True  False

50¢  
5¢  
10% of \$.50 is \$.05

True  False

150¢  
105¢  
10% of \$1.50 is \$1.05

True  False

—¢  
—¢  
10% of \$2.00 is \$.20

True  False

—¢  
—¢  
10% of \$14.50 is \$1.45

True  False

10% of \$.70 is \$7.00

True  False

10% of \$16.00 is \$1.60

True  False

10% of \$.29 is \$.29

True  False

Remember, in order to properly show cents with a decimal point, the decimal must show hundredths.

Doesn't show hundredths.

10% of \$1.60 is \$.160

True  False

10% of \$4.70 is \$.047

True  False

10% of \$300 is \$30

True  False

1% of \$600 is \$6

True  False

1% of \$7.00 is \$.07

True  False

1% of \$800 is \$8

True  False

1% of \$300.00 is \$30.00

True  False

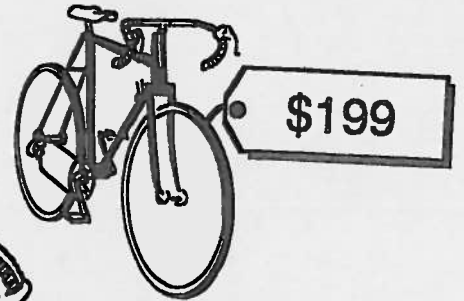
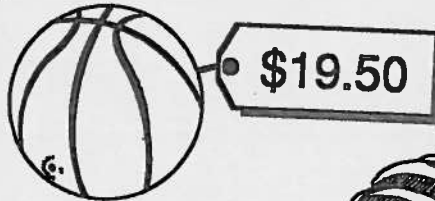
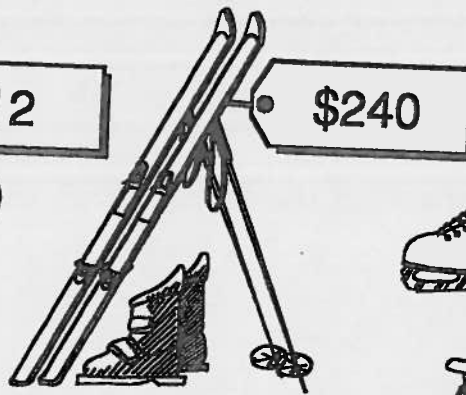
1% of \$12 is \$.12

True  False

1% of \$53 is \$5.30

True  False

Complete each sales receipt.



Buena Sports		
Item	Price	
1 Pair Skates	70	00
1 Pair Socks	3	50
Subtotal	73	50
10% Tax	7	35
Total	80	85

Buena Sports		
Item	Price	
1 Basketball		
1 Hoop		
Subtotal		
10% Tax		
Total		

Buena Sports		
Item	Price	
1 Ski Set		
1 Pair Skates		
Subtotal		
10% Tax		
Total		

Buena Sports		
Item	Price	
1 Bicycle		
1 Helmet		
Subtotal		
10% Tax		
Total		

Buena Sports		
Item	Price	
1 Bat		
1 Softball		
1 Glove		
Subtotal		
10% Tax		
Total		

Make up your own.

Buena Sports		
Item	Price	
Subtotal		
10% Tax		
Total		

The population of Rodeo City is 6,000,000. City planners expect it to grow by 1% each year for the next three years. Complete the chart to show how the population will grow. The population at the end of each year is the population at the beginning of the next year.

	Year 1	Year 2	Year 3
Population (Beginning of year)	6000000	6060000	
1% Increase	60000		
Population (End of year)	6060000		

Choose a word from the box to make each sentence true.

A cent is worth 10% of a dime.

A year is 10% of a \_\_\_\_\_.

A millimeter is 10% of a \_\_\_\_\_.

A decade is 10% of a \_\_\_\_\_.

A dime is 10% of a \_\_\_\_\_.

month	year
nickel	decade
<del>dime</del>	centimeter
meter	penny
century	dollar

Make three different true sentences using words from the box.

A \_\_\_\_\_ is 1% of a \_\_\_\_\_.

A \_\_\_\_\_ is 1% of a \_\_\_\_\_.

A \_\_\_\_\_ is 1% of a \_\_\_\_\_.

penny	century
centimeter	dollar
meter	year

Fill in each blank.

10% of 1 minute is \_\_\_\_\_ seconds.

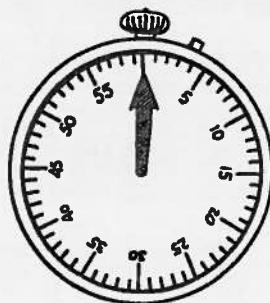
10% of 2 minutes is \_\_\_\_\_ seconds.

10% of 3 minutes is \_\_\_\_\_ seconds.

10% of 1 hour is \_\_\_\_\_ minutes.

10% of 2 hours is \_\_\_\_\_ minutes.

10% of 3 hours is \_\_\_\_\_ minutes.

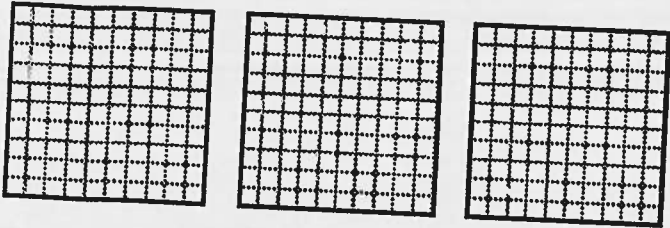


1 day = 24 hours  
1 hour = 60 minutes

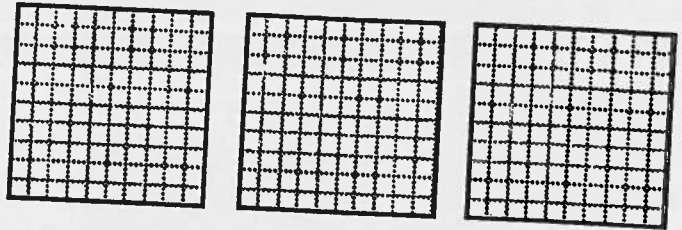
10% of 1 day is \_\_\_\_\_ minutes.

## Other Percents

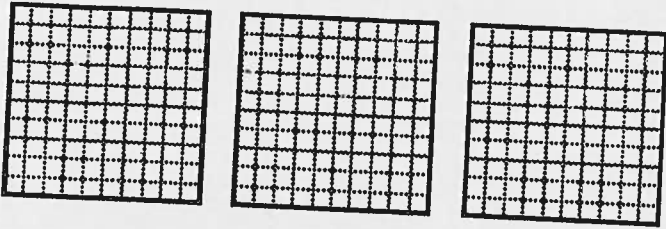
Shade 150% of a large square.



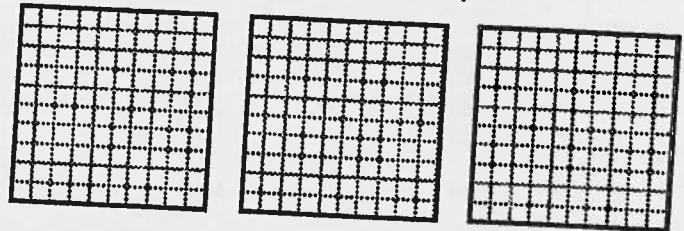
Shade 250% of a large square.



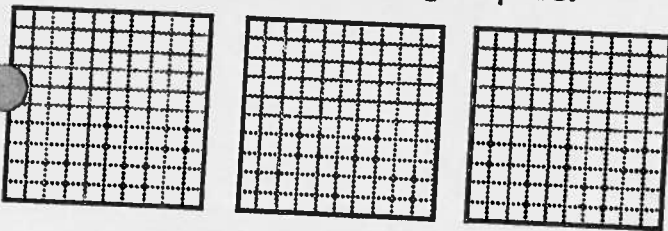
Shade 135% of a large square.



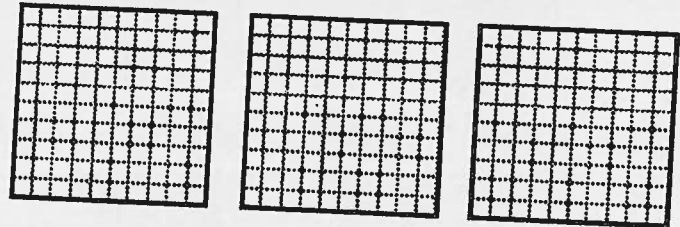
Shade 50% of a large square.



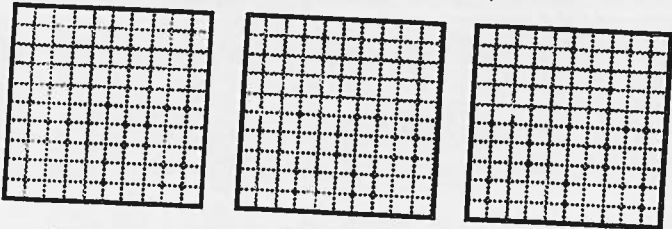
Shade 100% of a large square.



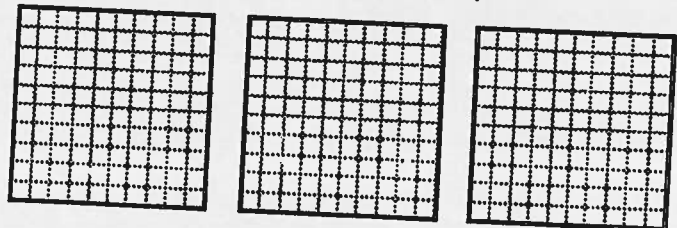
Shade 0% of a large square.



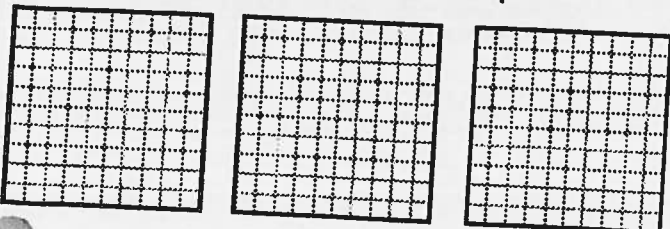
Shade 10% of a large square.



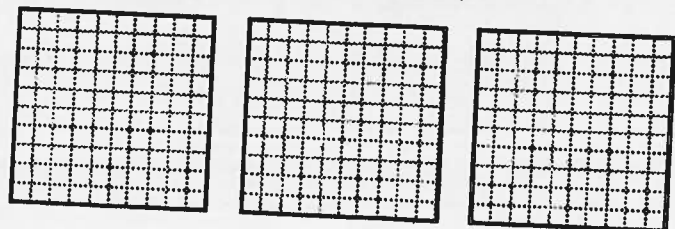
Shade 299% of a large square.



Shade 300% of a large square.

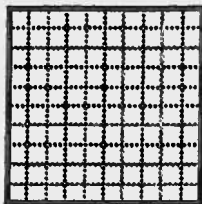


Shade 1% of a large square.

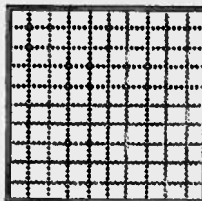


Work your way down each column. Can you find the pattern?

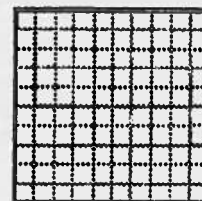
Shade  
16%.



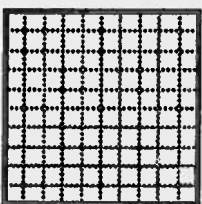
Shade  
64%.



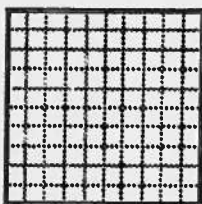
Shade  
81%.



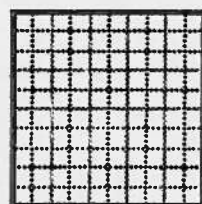
Shade  
8%.



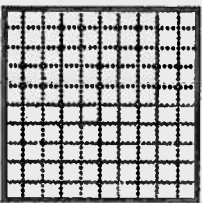
Shade  
16%.



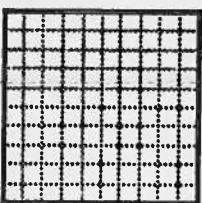
Shade  
27%.



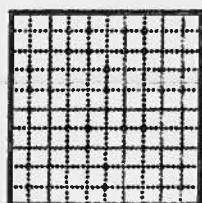
Shade  
4%.



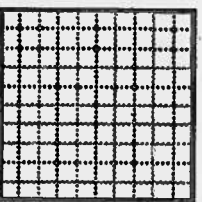
Shade  
4%.



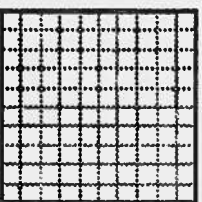
Shade  
9%.



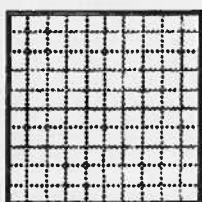
Shade  
2%.



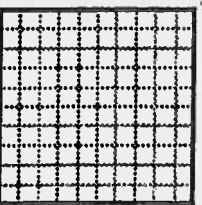
Shade  
1%.



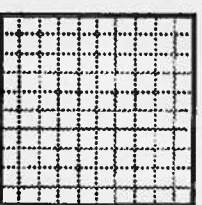
Shade  
3%.



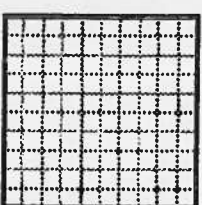
Shade  
1%.



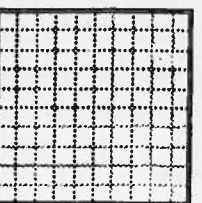
Shade  
 $\frac{1}{4}$ %.



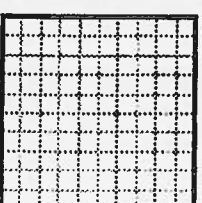
Shade  
1%.



Shade  
 $\frac{1}{2}$ %.



Shade  
 $\frac{1}{3}$ %.







100¢ = \$1.00

One hundred cents equals one dollar.



\_\_\_\_\_ % of a dollar



\_\_\_\_\_ % of a dollar



\_\_\_\_\_ % of \$1.00



\_\_\_\_\_ % of \$1.00

Use percent notation or a dollar amount to make each statement true.

\$.50 is \_\_\_\_\_ of a dollar.

\$.25 is \_\_\_\_\_ of a dollar.

\$.75 is \_\_\_\_\_ of a dollar.

\_\_\_\_\_ is 98% of a dollar.

\_\_\_\_\_ is 28% of \$1.00.

\$1.60 is \_\_\_\_\_ of \$1.00.

\_\_\_\_\_ is 46% of \$1.00.

\_\_\_\_\_ is 100% of \$1.00.

\$2.50 is \_\_\_\_\_ of \$1.00.

\$9.38 is \_\_\_\_\_ of \$1.00.

\$1.00 is \_\_\_\_\_ of \$2.00.

\$.50 is \_\_\_\_\_ of \$2.00.

\$.20 is \_\_\_\_\_ of \$2.00.

\$.02 is \_\_\_\_\_ of \$2.00.

A dime is \_\_\_\_\_ of a dollar.

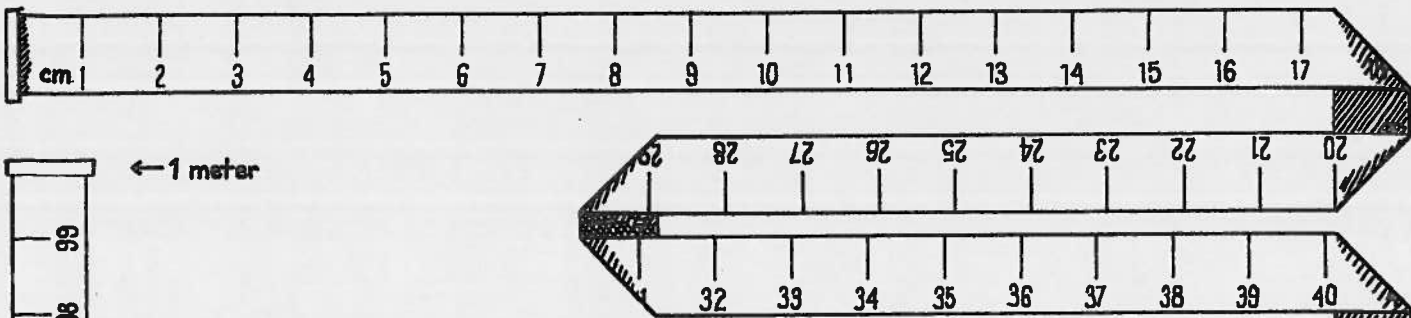
Three quarters is \_\_\_\_\_ of a dollar.

A nickel plus a dime plus a quarter is \_\_\_\_\_ of a dollar.

Make up your own!

\_\_\_\_\_ is \_\_\_\_\_ of one dollar.

\_\_\_\_\_ is \_\_\_\_\_ of two dollars.



**100 cm = 1 m**

One hundred centimeters equals one meter.

Use percent notation or a metric length to make each statement true.

50% of a meter is 50 cm.

85% of a meter is \_\_\_\_\_ cm.

25% of a meter is \_\_\_\_\_ cm.

136% of a meter is \_\_\_\_\_ cm.

2% of a meter is \_\_\_\_\_ cm.

450% of a meter is \_\_\_\_\_ cm.

5 cm is \_\_\_\_\_ of a meter.

30 cm is \_\_\_\_\_ of a meter.

100 cm is \_\_\_\_\_ of a meter.

300 cm is \_\_\_\_\_ of a meter.

\_\_\_\_\_ is 62% of a meter.

\_\_\_\_\_ is 198% of a meter.

Answer each question using a complete sentence.

Carlos can stretch his rubber band 83 cm without breaking it. What percent of a meter can Carlos stretch his rubber band?

Norma grows beans. Her tallest plant is 98 centimeters tall. This plant is what percent of a meter?

Alice is a champion high jumper. She can clear 238 cm. What percent of a meter can Alice jump?

In a track meet Jose entered the hop, skip and jump event. He hopped 102 cm, skipped 84 cm and jumped 112 cm. His total distance was what percent of a meter?

## Finding a Percent of a Number

Match.

0%	1%	10%	25%	50%	100%	200%	300%
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
one tenth	none	one hundredth	all	one fourth	triple	one half	double

*(A line is drawn from the 0% dot to the 'none' dot.)*

Choose the correct ending for each sentence from the box on the right.

- To find 0% of a number you write zero.
- To find 1% of a number you \_\_\_\_\_.
- To find 10% of a number you \_\_\_\_\_.
- To find 25% of a number you \_\_\_\_\_.
- To find 50% of a number you \_\_\_\_\_.
- To find 100% of a number you \_\_\_\_\_.
- To find 200% of a number you \_\_\_\_\_.
- To find 300% of a number you \_\_\_\_\_.

divide by 4

multiply by 2

write the number

~~write zero~~

divide by 100

divide by 10

multiply by 3

divide by 2

Make each statement true.

- 25% of 400 is 400 divided by 4.      0% of 400 is \_\_\_\_\_.
- 10% of 400 is \_\_\_\_\_ divided by \_\_\_\_\_.      1% of 400 is \_\_\_\_\_ divided by \_\_\_\_\_.
- 100% of 400 is \_\_\_\_\_.
- 50% of 400 is \_\_\_\_\_.
- 200% of 400 is \_\_\_\_\_.
- 300% of 400 is \_\_\_\_\_ times \_\_\_\_\_.

25% of 16 is \_\_\_\_\_. 25% of \$80 is \_\_\_\_\_. \_\_\_\_\_ is 25% of 400.  
 50% of 16 is \_\_\_\_\_. 50% of \$80 is \_\_\_\_\_. \_\_\_\_\_ is 50% of 400.  
 75% of 16 is \_\_\_\_\_. 75% of \$80 is \_\_\_\_\_. \_\_\_\_\_ is 75% of 400.  
 100% of 16 is \_\_\_\_\_. 100% of \$80 is \_\_\_\_\_. \_\_\_\_\_ is 100% of 400.  
 125% of 16 is \_\_\_\_\_. 125% of \$80 is \_\_\_\_\_. \_\_\_\_\_ is 125% of 400.

0% of 60 is \_\_\_\_\_. 0% of 120 is \_\_\_\_\_.

Start here. ↓  
 10% of 60 is \_\_\_\_\_.  
 25% of 60 is \_\_\_\_\_.  
 50% of 60 is \_\_\_\_\_.  
 100% of 60 is \_\_\_\_\_.

Start here. ↓  
 10% of 120 is \_\_\_\_\_.  
 25% of 120 is \_\_\_\_\_.  
 50% of 120 is \_\_\_\_\_.  
 100% of 120 is \_\_\_\_\_.

200% of 60 is \_\_\_\_\_. 200% of 120 is \_\_\_\_\_.  
 300% of 60 is \_\_\_\_\_. 300% of 120 is \_\_\_\_\_.

1% of \$200 is \_\_\_\_\_. 1% of 3700 is \_\_\_\_\_.  
 10% of \$200 is \_\_\_\_\_. 10% of 3700 is \_\_\_\_\_.  
 25% of \$200 is \_\_\_\_\_. 25% of 3700 is \_\_\_\_\_.  
 50% of \$200 is \_\_\_\_\_. 50% of 3700 is \_\_\_\_\_.  
 100% of \$200 is \_\_\_\_\_. 100% of 3700 is \_\_\_\_\_.  
 200% of \$200 is \_\_\_\_\_. 200% of 3700 is \_\_\_\_\_.  
 300% of \$200 is \_\_\_\_\_. 300% of 3700 is \_\_\_\_\_.

100% of 48 is \_\_\_\_\_. 10% of 120 is \_\_\_\_\_.  
 50% of 48 is \_\_\_\_\_. 5% of 120 is \_\_\_\_\_ *½ of 10%*  
 25% of 48 is \_\_\_\_\_. 2.5% of 120 is \_\_\_\_\_ *½ of 5%*  
 12.5% of 48 is \_\_\_\_\_ *½ of 25%*. 1.25% of 120 is \_\_\_\_\_.

5 is \_\_\_\_\_ of 500.

50 is \_\_\_\_\_ of 500.

125 is \_\_\_\_\_ of 500.

250 is \_\_\_\_\_ of 500.

500 is 100% of 500.

1000 is \_\_\_\_\_ of 500.

1500 is \_\_\_\_\_ of 500.

\$4 is \_\_\_\_\_ of \$400.

\$40 is \_\_\_\_\_ of \$400.

\$100 is \_\_\_\_\_ of \$400.

\$200 is \_\_\_\_\_ of \$400.

\$400 is \_\_\_\_\_ of \$400.

\$800 is \_\_\_\_\_ of \$400.

\$1200 is \_\_\_\_\_ of \$400.

0 is \_\_\_\_\_ of 120.

30 is \_\_\_\_\_ of 120.

60 is \_\_\_\_\_ of 120.

90 is \_\_\_\_\_ of 120.

120 is \_\_\_\_\_ of 120.

1000 is \_\_\_\_\_ of 1000.

100 is \_\_\_\_\_ of 1000.

200 is \_\_\_\_\_ of 1000.

300 is \_\_\_\_\_ of 1000.

400 is \_\_\_\_\_ of 1000.

\$96 is \_\_\_\_\_ of \$96.

\$48 is \_\_\_\_\_ of \$96.

\$24 is \_\_\_\_\_ of \$96.

\$72 is \_\_\_\_\_ of \$96.

\$0 is \_\_\_\_\_ of \$96.

\$15 is \_\_\_\_\_ of \$150.

\$30 is \_\_\_\_\_ of \$150.

\$45 is \_\_\_\_\_ of \$150.

\$60 is \_\_\_\_\_ of \$150.

\$75 is \_\_\_\_\_ of \$150.

\$90 is \_\_\_\_\_ of \$150.

\$105 is \_\_\_\_\_ of \$150.

\$120 is \_\_\_\_\_ of \$150.

\$135 is \_\_\_\_\_ of \$150.

\$150 is \_\_\_\_\_ of \$150.

\$165 is \_\_\_\_\_ of \$150.

\$7 is \_\_\_\_\_ of \$70.

\$14 is \_\_\_\_\_ of \$70.

\$21 is \_\_\_\_\_ of \$70.

\$28 is \_\_\_\_\_ of \$70.

\$35 is \_\_\_\_\_ of \$70.

\$5 is \_\_\_\_\_ of \$50.

\$10 is \_\_\_\_\_ of \$50.

\$20 is \_\_\_\_\_ of \$50.

\$40 is \_\_\_\_\_ of \$50.

\$80 is \_\_\_\_\_ of \$50.

What percent of the problems on this page do you think you did correctly? \_\_\_\_\_

Pat took the test below. Put *C* by each problem Pat did correctly and *X* by each answer that is wrong. Don't write anything by the problems that Pat did not do.

		Pat
		Percent Quiz
	1. 100% of 53 is <u>53</u> . <i>C</i>	11. 10% of 1500 is ____.
○	2. 0% of 53 is <u>53</u> . <i>X</i>	12. 1% of 200 is ____.
	3. 50% of 128 is <u>68</u> .	13. 1% of 1500 is ____.
	4. 50% of \$20 is <u>\$10</u> .	14. 1% of 300 is <u>3</u> .
	5. 50% of 48cm is <u>24cm</u> .	15. 2% of 300 is <u>6</u> .
	6. 50% of 21 is ____.	16. 3% of 300 is ____.
	7. 25% of 32 is <u>8</u> .	17. 6% of 300 is <u>12</u> .
	8. 25% of 64 is <u>24</u> .	18. 12 is <u>50</u> % of 6.
○	9. 25% of 96 is <u>24</u> .	19. 12 is <u>100</u> % of 12.
	10. 10% of 200 is <u>20</u> .	20. 12 is <u>50</u> % of 24.

There are five mistakes on Pat's paper.

5 is what percent of 20?

What percent of the problems on the test did Pat do wrong? \_\_\_\_\_

How many of the problems did Pat not do? \_\_\_\_\_

What percent of the problems on the test did Pat not do? \_\_\_\_\_

What percent of the problems on the test did Pat do correctly? \_\_\_\_\_

How would you rate Pat's work?  Poor  Fair  Good  Excellent

You know how to find these percents of some numbers:

1%      10%      25%      50%      100%      200%      300%

You can use these familiar percents to figure out other percents.

\_\_\_\_\_ % = 25% + 1%

\_\_\_\_\_ % = 50% - 10%

\_\_\_\_\_ % = 10% + 10% + 1%

\_\_\_\_\_ % = 50% - 1% - 1%

\_\_\_\_\_ % = 25% - 1% - 1%

\_\_\_\_\_ % = 100% - 10% + 1%

24% = \_\_\_\_\_

51% = \_\_\_\_\_

75% = \_\_\_\_\_

35% = \_\_\_\_\_

9% = \_\_\_\_\_

299% = \_\_\_\_\_

The first and second problems in each group are easy. You can find the answers to the two harder problems by adding or subtracting the first two answers.

25% of 200 is 50.  
 1% of 200 is 2.  
 24% of 200 is 48.      26% of 200 is 52.

50% of 600 is \_\_\_\_\_.  
 1% of 600 is \_\_\_\_\_.  
 51% of 600 is \_\_\_\_\_.      49% of 600 is \_\_\_\_\_.

25% of 160 is \_\_\_\_\_.  
 10% of 160 is \_\_\_\_\_.  
 35% of 160 is \_\_\_\_\_.      15% of 160 is \_\_\_\_\_.

200% of 36 is \_\_\_\_\_.  
 25% of 36 is \_\_\_\_\_.  
 175% of 36 is \_\_\_\_\_.      225% of 36 is \_\_\_\_\_.

100% of 210 is \_\_\_\_\_.  
 10% of 210 is \_\_\_\_\_.  
 90% of 210 is \_\_\_\_\_.      110% of 210 is \_\_\_\_\_.

10% of 400 is \_\_\_\_\_.  
 1% of 400 is \_\_\_\_\_.  
 11% of 400 is \_\_\_\_\_.      9% of 400 is \_\_\_\_\_.

10% of 500 is \_\_\_\_\_.

1% of 500 is \_\_\_\_\_.

11% of 500 is \_\_\_\_\_.

9% of 500 is \_\_\_\_\_.

100% of 40 is \_\_\_\_\_.

10% of 40 is \_\_\_\_\_.

90% of 40 is \_\_\_\_\_.

110% of 40 is \_\_\_\_\_.

200% of 60 is \_\_\_\_\_.

10% of 60 is \_\_\_\_\_.

190% of 60 is \_\_\_\_\_.

210% of 60 is \_\_\_\_\_.

100% of 36 is \_\_\_\_\_.

25% of 36 is \_\_\_\_\_.

75% of 36 is \_\_\_\_\_.

125% of 36 is \_\_\_\_\_.

10% of 800 is \_\_\_\_\_.  
1% of 800 is \_\_\_\_\_.

11% of 800 is \_\_\_\_\_.

25% of 300 is \_\_\_\_\_.  
1% of 300 is \_\_\_\_\_.

24% of 300 is \_\_\_\_\_.

\_\_\_\_% of 700 is \_\_\_\_\_.  
\_\_\_\_% of 700 is \_\_\_\_\_.

9% of 700 is \_\_\_\_\_.

100% of 30 is \_\_\_\_\_.  
10% of 30 is \_\_\_\_\_.

90% of 30 is \_\_\_\_\_.

100% of 24 is \_\_\_\_\_.  
50% of 24 is \_\_\_\_\_.

150% of 24 is \_\_\_\_\_.

\_\_\_\_% of 40 is \_\_\_\_\_.  
\_\_\_\_% of 40 is \_\_\_\_\_.

225% of 40 is \_\_\_\_\_.

26% of 200 is \_\_\_\_\_.

24% of 200 is \_\_\_\_\_.

24% of 800 is \_\_\_\_\_.

210% of 40 is \_\_\_\_\_.

190% of 40 is \_\_\_\_\_.

175% of 40 is \_\_\_\_\_.

35% of 80 is \_\_\_\_\_.

15% of 80 is \_\_\_\_\_.

15% of 20 is \_\_\_\_\_.

301% of 700 is \_\_\_\_\_.

299% of 700 is \_\_\_\_\_.

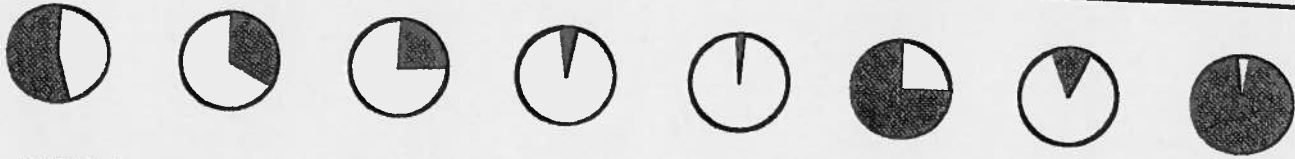
290% of 700 is \_\_\_\_\_.



# Estimating Percents

Use a number in the box to name the shaded part of each circle.

- |     |                |    |     |     |     |                  |                   |
|-----|----------------|----|-----|-----|-----|------------------|-------------------|
| 23% | <del>55%</del> | 5% | 75% | 33% | 95% | $2\frac{1}{2}\%$ | $12\frac{1}{2}\%$ |
|-----|----------------|----|-----|-----|-----|------------------|-------------------|



55%

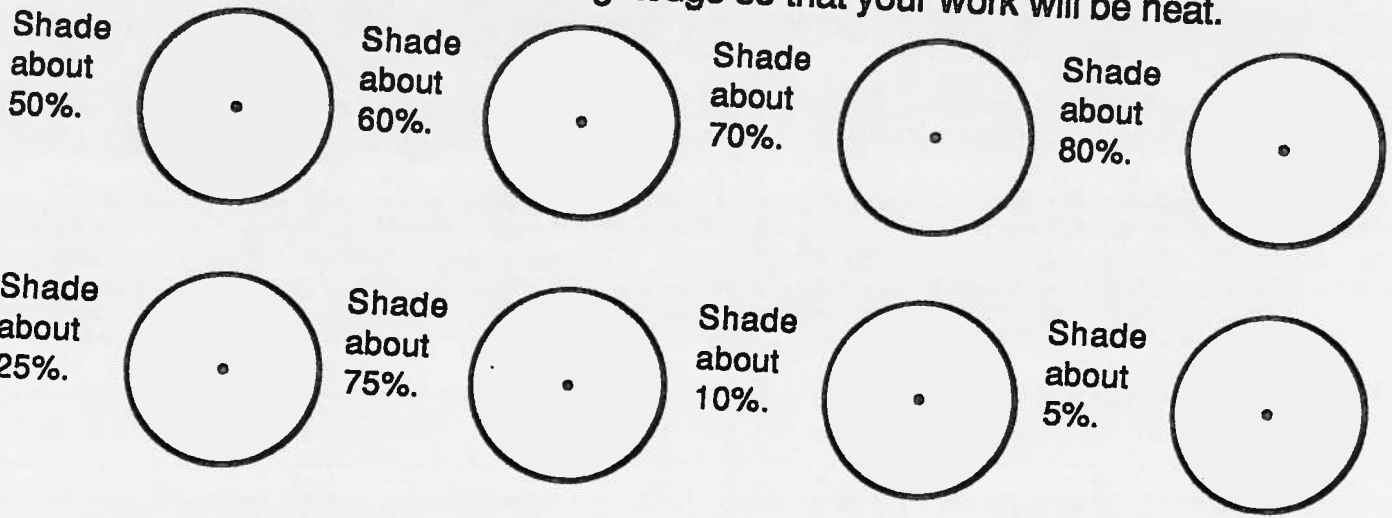
\_\_\_\_\_

Match a number in the box with each approximate amount.

- |    |     |     |     |      |      |
|----|-----|-----|-----|------|------|
| 9% | 26% | 52% | 47% | 199% | 105% |
|----|-----|-----|-----|------|------|

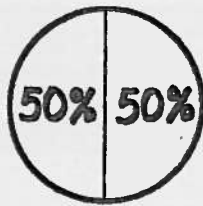
- |                                |                             |                             |                              |                        |                           |
|--------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------|---------------------------|
| a little more than one quarter | a little more than one half | a little less than one half | a little less than one tenth | a little more than all | a little less than double |
| _____                          | _____                       | _____                       | _____                        | _____                  | _____                     |

Shade part of each circle. Use a straightedge so that your work will be neat.

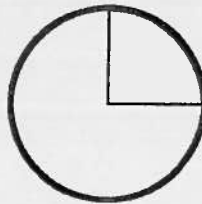


Which set of percents best fits the pie chart? Write the percents on the pie pieces.

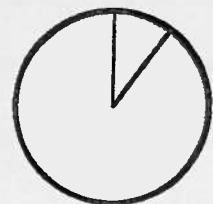
10%	90%
25%	75%
40%	60%
50%	50%



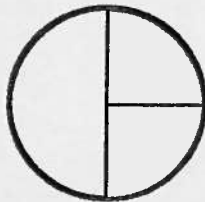
10%	90%
25%	75%
40%	60%
50%	50%



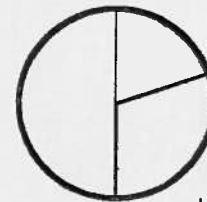
10%	90%
25%	75%
40%	60%
50%	50%



10%	20%	70%
20%	30%	50%
25%	25%	50%
30%	30%	40%

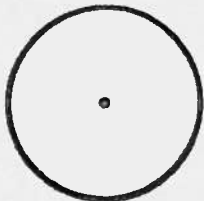


10%	20%	70%
20%	30%	50%
25%	25%	50%
30%	30%	40%

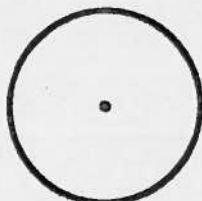


Divide each circle below to show the percents given. Write the percents on your pieces of pie. You'll have to estimate to decide how big to make each piece.

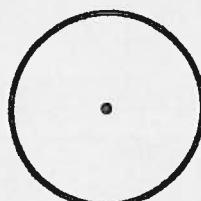
50% 50%



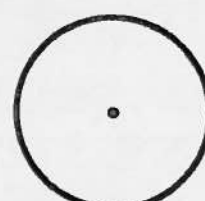
40% 60%



80% 20%



50% 40% 10%



In the year 2000, it is estimated that 6,121,000,000 people will live on earth.

### World Population

Make a pie chart to show the information below. Label each piece of pie with the name of a continent and a percent. The size of each should match its percent.

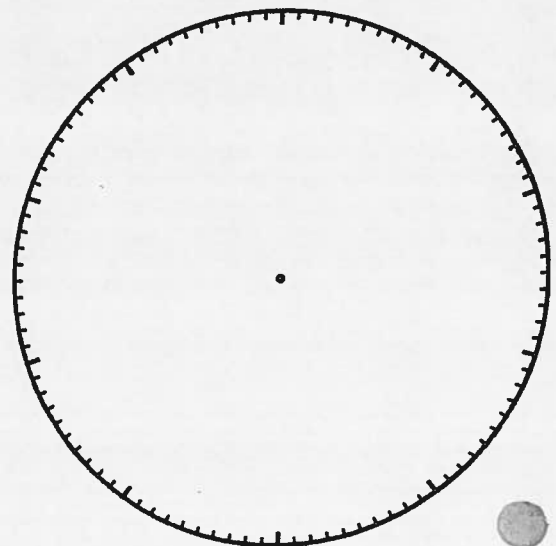
About 60% will live in Asia.

About 15% will live in Africa.

About 11% will live in Europe.

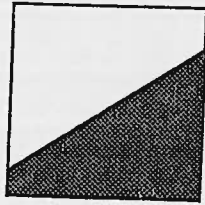
About 9% will live in South America.

About 5% will live in North America.



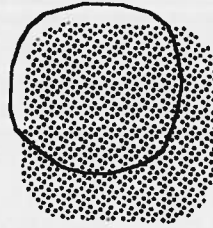
Circle the percent that best answers the question.

About what percent of the square is shaded?



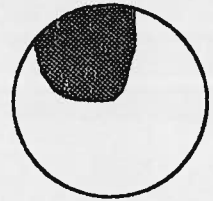
25% 50% 75%

About what percent of the dots are circled?



25% 50% 75%

About what percent of the circle is shaded?



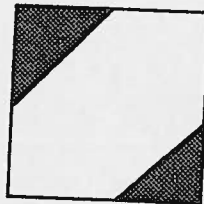
25% 50% 75%

About what percent of the cup is filled?



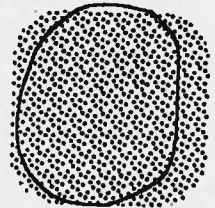
10% 25% 50%

About what percent of the square is shaded?



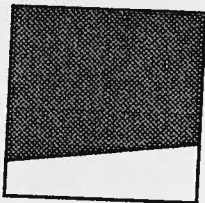
1% 10% 25%

About what percent of the dots are circled?



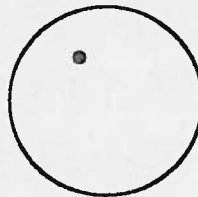
25% 50% 75%

About what percent of the square is shaded?



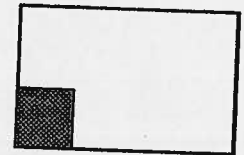
25% 50% 75%

About what percent of the circle is shaded?



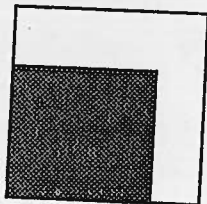
1% 10% 25%

About what percent of the wall is painted?



10% 25% 50%

About what percent of the square is shaded?



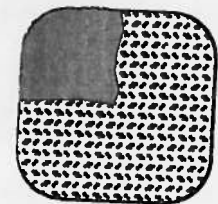
25% 50% 75%

About what percent of a cup is filled?



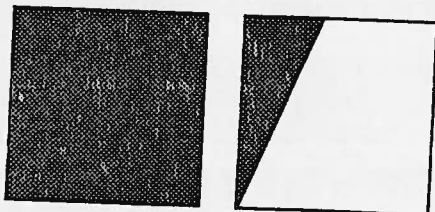
25% 50% 75%

About what percent of the rug is stained?



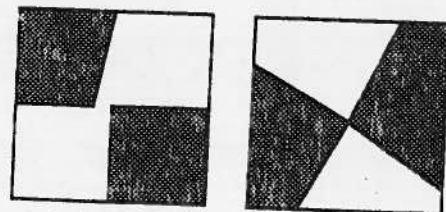
1% 10% 25%

About what percent of one square is shaded?



75% 100% 125%

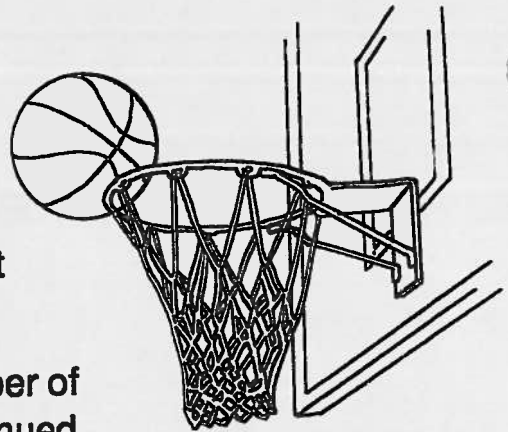
About what percent of one square is shaded?



75% 100% 125%

## Percent is Based on 100

Pat plays on the school basketball team. In the first game of the season, Pat made 3 out of 4 shots. In the second game Pat made 4 out of 5 and in the third 7 out of 10. Pat wondered, "In which game did I shoot the best?" How can Pat find out?



It would be easy to tell if Pat had tried the same number of shots in each game. Let's pretend that Pat had continued to make 3 out of every 4, or 4 out of every 5, or 7 out of every 10 shots for 100 tries.

Game 1	Shots made	3	6	9	12	15	30	45	60	75
	Shots tried	4	8	12	16	20	40	60	80	100

Handwritten annotations:  $\times 2$  and  $\times 3$  above the first row, and  $\times 2$  and  $\times 3$  above the second row.

3 out of 4 is 75%.

You complete the tables below to find Pat's shooting percent in Games 2 and 3.

Game 2	Shots made	4								
	Shots tried	5	10	20	30	40	50	100		

Handwritten annotations:  $\times 2$ ,  $\times 4$ ,  $\times 6$  above the first row, and  $\times 2$ ,  $\times 4$ ,  $\times 6$  above the second row.

4 out of 5 is \_\_\_\_%.

Game 3	Shots made	7								
	Shots tried	10	20	30	40	50	100			

7 out of 10 is \_\_\_\_%.

In which game did Pat shoot the best? \_\_\_\_\_

Complete the tables to find the shooting percents of three other players in Game 1.

Sandy	Shots made	13								
	Shots tried	20	40	60	80	100				

13 out of 20 is \_\_\_\_%.

Terry	Shots made	6								
	Shots tried	10	20	30	40	50	100			

6 out of 10 is \_\_\_\_%.

Chris	Shots made	12								
	Shots tried	25	50	75	100					

12 out of 25 is \_\_\_\_%.

Who was the most accurate shooter, Sandy, Terry or Chris? \_\_\_\_\_

Complete the table to solve each problem below.

Jan got 12 out of 20 votes for class president. What percent of the votes did Jan get?

Votes for Jan	12				
Total votes	20	40	60	80	100

*(Handwritten annotations: x2, x3 above the table; x2, x3 below the table)*

12 out of 20 is \_\_\_\_%.  
Jan got \_\_\_\_% of the votes.

Tanya got 18 hits in 40 times at bat playing softball last season. What was her batting average?

Hits	18				
Times at bat	40	20	100		

*(Handwritten annotations: +2, x5 above the table; +2, x5 below the table)*

18 out of 40 is \_\_\_\_%.  
Her batting average was \_\_\_\_%.

Philip got 24 out of 30 problems correct on his math test. What percent of the problems did he get correct?

Problems correct	24			
Problems on test	30	10	50	100

*(Handwritten annotations: +3, x5, x2 above the table; +3, x5, x2 below the table)*

24 out of 30 is \_\_\_\_%.  
Philip got \_\_\_\_% of the problems correct.

The algebra class at Smalltown High School has 36 students. 30 is supposed to be the class size limit. What percent of the size limit was the algebra class?

Students in class	36			
Class size limit	30	10	50	100

36 compared to 30 is \_\_\_\_%.  
There were \_\_\_\_% as many students in the class as there were supposed to be.

Make up your own table to solve each problem below.

18 of 20 students in Ms. Serra's French class came to class last Friday. What percent of the class was present?

Present					
In the class					

18 out of 20 is \_\_\_\_%.  
\_\_\_\_% of the class was present.

Pat and Chris are digging a ditch that will be 25 meters long. They have dug 7 meters. What percent of the ditch have they dug?

Meters dug					
Meters of ditch					

7 out of 25 is \_\_\_\_%.  
They have dug \_\_\_\_% of the ditch.

The Bay High girl's softball team has won 18 of their last 30 games. What percent of their last 30 games have they won?

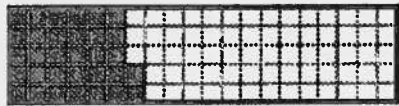
Games won					
Games played					

8 out of 30 is \_\_\_\_%. They have won \_\_\_\_% of their last 30 games.

**Write each percent in three ways.**

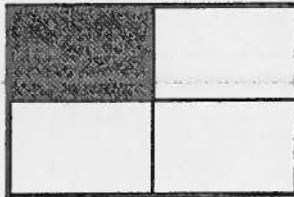
Using words	As a fraction with denominator 100	As a number with percent notation
25 out of every 100		
	$\frac{5}{100}$	
		100%

**What percent of each figure is shaded?**



\_\_\_\_\_ % is shaded.

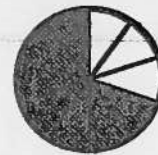
\_\_\_\_\_ % is not shaded.



\_\_\_\_\_ % is shaded.

\_\_\_\_\_ % is not shaded.

10 equal pieces



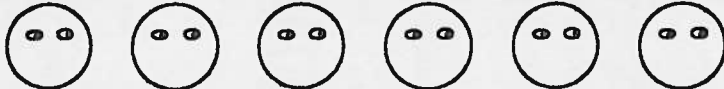
\_\_\_\_\_ % is shaded.

\_\_\_\_\_ % is not shaded.

Put hair on 50% of the heads.



Put a nose on 25% of the heads.



Put a smile on 100% of the heads.

0% of 35 is \_\_\_\_\_. 25% of 1600 is \_\_\_\_\_.

25% of 16 is \_\_\_\_\_. 0% of 7643 is \_\_\_\_\_.

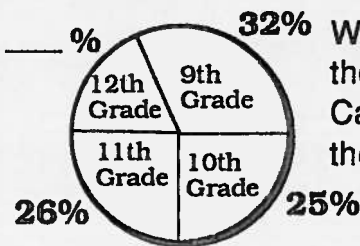
50% of 48 is \_\_\_\_\_. 100% of 985 is \_\_\_\_\_.

100% of 80 is \_\_\_\_\_. 50% of 4444 is \_\_\_\_\_.

2 is \_\_\_\_\_ % of 8. 6 is \_\_\_\_\_ % of 12.

**Fill in the missing percent.  
 Then answer the question.**

**Students at Cabot High School**



What percent of the students at Cabot High are in the 12th grade?

\_\_\_\_\_

Practice Test - Page 2

100% of 25 is \_\_\_\_\_.

10% of 600 is \_\_\_\_\_.

1% of 900 is \_\_\_\_\_.

200% of 25 is \_\_\_\_\_.

20% of 600 is \_\_\_\_\_.

2% of 900 is \_\_\_\_\_.

300% of 25 is \_\_\_\_\_.

30% of 600 is \_\_\_\_\_.

3% of 900 is \_\_\_\_\_.

Complete the sales receipt.

Buena Sports	
Item	Price
1 Sweatshirt	12 95
1 Pair Sneakers	29 95
Subtotal	
10% Tax	
Total	

One quarter is \_\_\_\_\_% of a dollar.

A dime plus a nickel is \_\_\_\_\_% of a dollar.

1 centimeter is \_\_\_\_\_% of a meter.

50 centimeters is \_\_\_\_\_% of a meter.

One decade is \_\_\_\_\_% of a century.

10% of one hour is \_\_\_\_\_ minutes.

25% of 200 is \_\_\_\_\_.

1% of 200 is \_\_\_\_\_.

24% of 200 is \_\_\_\_\_.

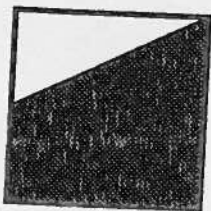
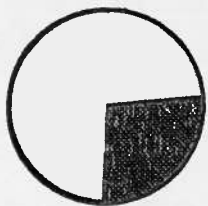
26% of 200 is \_\_\_\_\_.

25% of 40 is \_\_\_\_\_.

10% of 40 is \_\_\_\_\_.

35% of 40 is \_\_\_\_\_.

Circle the percent that best names the part that is shaded.



10%    25%    50%

25%    50%    75%

Complete the table to answer the question.

Aran got 32 out of 40 problems correct on his math test. What percent did he get correct?

Problems correct	32				
Problems on test	40				

32 out of 40 is \_\_\_\_\_%.

Aran got \_\_\_\_\_% of the problems correct.

## Key to Percents® workbooks

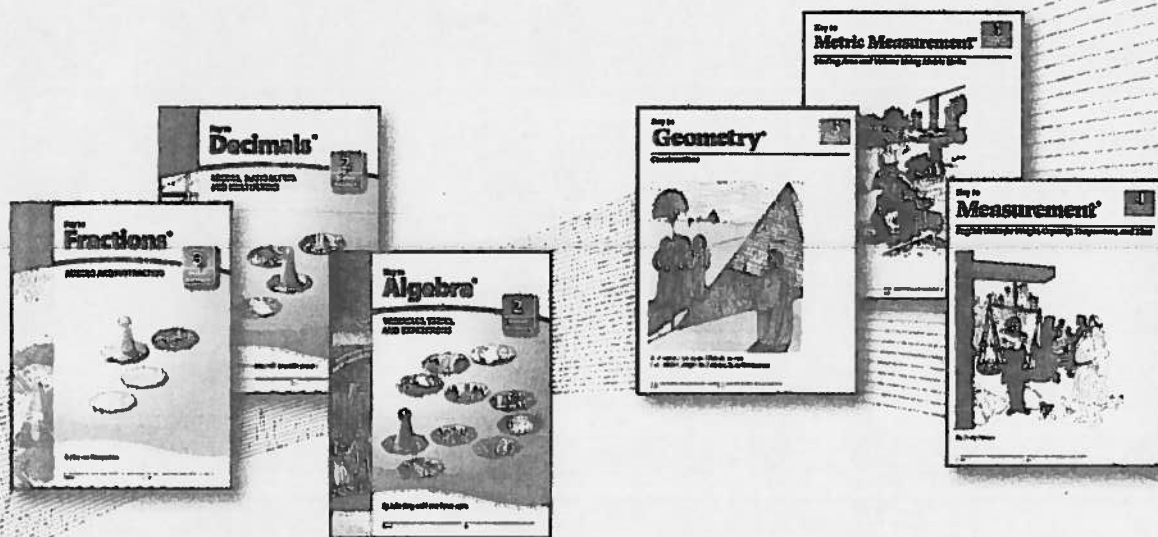
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