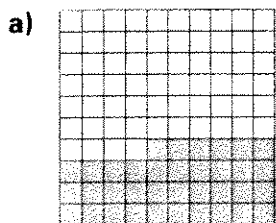


4.1 Percents as Fractions and Decimals

GOAL

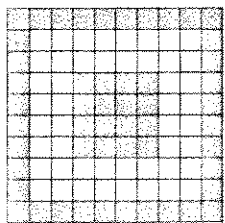
Solve percent problems using equivalent fractions or decimals.

1. Write the number of shaded squares in each diagram as a fraction, a decimal, and a percent.



fraction _____ decimal _____ percent _____

- b) fraction _____ decimal _____ percent _____



At-Home Help

A **percent** is used to compare a part to a whole.

For example, you could say that 55% of the students in your class are boys.

You can write 55% as a **fraction**.

To rename a percent as a fraction, write the percent over 100.

For example, 55% is the same as $\frac{55}{100}$.

You can rewrite the fraction in lower terms.

For example, $55 \div 5 = 11$ and $100 \div 5 = 20$, so the fraction in lower terms is $\frac{11}{20}$.

You can also write 55% as a **decimal**. 55% is $\frac{55}{100}$, which is 55 hundredths, or 0.55.

2. Write each percent as a fraction.

a) $44\% =$ _____ b) $13\% =$ _____ c) $25\% =$ _____ d) $98\% =$ _____

3. Write each decimal as a percent.

a) $0.76 =$ _____ b) $0.73 =$ _____ c) $0.33 =$ _____ d) $0.02 =$ _____

4. Arrange these values in order from least to greatest.

77% , 0.67 , 98% , $\frac{56}{100}$, $\frac{25}{100}$

4.2 Investigating Percents

GOAL

Explore how percents can be used.

- The label below is from a bag of potato chips. Read the label to identify the percent daily value (% daily value) of each nutritional component.

Nutrition Facts		Valeur nutritive	
Per 21 chips (50 g) pour 21 croustilles (50 g)			
Amount		% Daily Value	
Teneur		% valeur quotidienne	
Calories / Calories 260			
Fat / Lipides	13 g	20 %	
Saturated / saturés 1.5 g			
+ Trans / trans 0 g			
Cholesterol / Cholestérol	0 mg	0 %	
Sodium / Sodium	310 mg	13 %	
Carbohydrate / Glucides	32 g	11 %	
Fibre / Fibres 2 g			
Sugars / Sucres 1 g			
Protein / Protéines	3 g		
Vitamin A / Vitamine A		2 %	
Vitamin C / Vitamine C		2 %	
Calcium / Calcium		6 %	
Iron / Fer		4 %	

At-Home | Help

You can use percents to show the amount of fat or carbohydrates in a serving of food.

For example,

Fat: 13 g

Total serving: 50 g

$$\frac{13}{50} = 26\%$$

Fats make up 26% of one serving.

Note: The *percent daily value* (% daily value) shown on a label tells how much of what your body needs each day is contained in the food. It does not tell the percent of each nutritional component in one serving.

- fat _____
 - fibre _____
 - calcium _____
 - sodium _____
 - Vitamin A _____
 - iron _____
- Calculate the percent of each nutritional component that is found in one serving of 21 chips.
 - fat _____
 - fibre _____
 - carbohydrates _____
 - protein _____

4.3 Estimating Percents

GOAL

Determine approximate values using estimation.

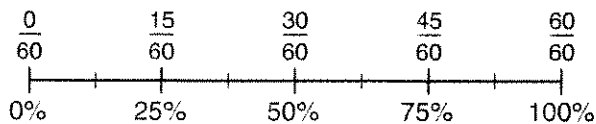
1. Write each percent as a decimal. Then use the decimal to estimate the answer. The first one is done for you.

- a) 9% of 30 9% = 0.09, which is close to 0.1, and $0.1 \times 30 = 3$
 b) 23% of 40 _____
 c) 54% of 46 _____
 d) 72% of 30 _____

2. Write each percent as a fraction. Then, use the fraction to estimate the answer. The first one is done for you.

- a) 12% of 25 $12\% = \frac{12}{100}$, or about $\frac{1}{10}$. $\frac{1}{10}$ of 25 is about 3.
 b) 19% of 60 _____
 c) 52% of 68 _____
 d) 77% of 40 _____

3. Use the number line below to help you estimate each of the following fractions.



- a) $\frac{53}{60}$ _____ c) $\frac{21}{60}$ _____
 b) $\frac{33}{60}$ _____ d) $\frac{17}{60}$ _____

4. Jessica received $\frac{45}{51}$ on her math test. About what percent did Jessica get on the test?

At-Home Help

You can estimate the percent of a number using fractions you know. Here are some useful fractions:

$$\frac{20}{100} = \frac{1}{5} \qquad \frac{25}{100} = \frac{1}{4}$$

$$\frac{33}{100} = \text{about } \frac{1}{3} \qquad \frac{50}{100} = \frac{1}{2}$$

$$\frac{75}{100} = \frac{3}{4} \qquad \frac{80}{100} = \frac{4}{5}$$

For example, to estimate 35% of 40, change 35% to a fraction.

$35\% = \frac{35}{100}$, which is close to $\frac{33}{100}$, or about $\frac{1}{3}$. Next, estimate $\frac{1}{3}$ of 40, which is close to $\frac{1}{3}$ of 39. The answer is about 13.

You can also estimate the percent of a number using decimals.

For example, to estimate 35% of 40, change 35% to a decimal: $35\% = 0.35$. Next, estimate the multiplication: 0.35×40 is between $0.3 \times 40 = 12$ and $0.4 \times 40 = 16$, so the answer is about 14.

4.4 Using Percents to Make Comparisons

GOAL

Compare fractions and ratios using percents.

1. Rename each decimal, ratio, or fraction as a percent.

a) 0.83 _____ d) 0.49 _____

b) $\frac{3}{5}$ _____ e) 9 out of 10 parts _____

c) 0.05 _____ f) $\frac{3}{4}$ _____

2. Order these values from least to greatest.

$\frac{2}{3}$, 88%, $\frac{4}{5}$, 25%, 0.75 _____

3. Place <, >, or = to make each number statement true.

a) 0.05 _____ $\frac{1}{4}$ c) 2 out of 3 parts _____ 60%

b) 0.72 _____ $\frac{7}{10}$ d) 20% _____ $\frac{1}{5}$

4. Calculate the percent off for each sale. Which sale offers the best deal?

a) \$20.00 shoes on sale for \$10.00

b) \$15.00 shoes on sale for \$10.00

5. Jessica got 16 out of 20 on her science test. Nick got 85% on the same test. Who got the higher mark?

6. Ashley can buy three shirts for a total of \$60.00, or two shirts for a total of \$50.00 with an additional 20% off. Which is the better buy?

At-Home Help

To compare fractions, decimals, and ratios, rename each value as a percent, and then compare.

For example, I want to compare $\frac{4}{5}$ and 0.6.

$$\frac{4}{5} = \frac{80}{100} \text{ or } 80\%. \quad 0.6 = 60\%.$$

So, $\frac{4}{5}$ is greater than 0.6.

4.5 Calculating with Percents

GOAL

Solve problems that involve percents using equivalent ratios.

1. Calculate.

- | | |
|---------------|--------------|
| a) 20% of 100 | d) 20% of 40 |
| b) 15% of 50 | e) 10% of 30 |
| c) 40% of 20 | f) 25% of 80 |

2. Gail found a pair of jeans for \$48.00. She got an additional 20% off.

a) How much money did Gail save on the jeans?

b) What price did Gail pay for the jeans, not including tax?

3. Nick is shopping for a DVD for his father. At Sounds Mart, DVDs are \$24.00 with 33% off. At Audio Giant, DVDs are \$20.00 with 15% off. Which store should Nick buy DVDs at?

At-Home Help

Here are some methods you can use to solve percent problems:

- Rewrite the percent problem using a proportion, and solve for the missing term.

For example, to calculate 15% of 40, write $\frac{15}{100} = \frac{?}{40}$. Solve for the missing term.

- Use mental math.

For example, to calculate 15% of 40, think: "10% of 40 is 4. 5% is half of 10%, or 2. So, 15% is $4 + 2 = 6$."

4.6 Solving Problems that Involve Decimals

GOAL

Solve problems that involve percents and decimals.

You may need a calculator for this lesson.

1. Calculate.

- a) 1% of 28.50 c) 10% of 19.6
 b) 5% of 54.8 d) 9% of 600

2. Add 6% GST to each item. What is the final price?

- a) a shirt for \$22.50 _____
 b) a T-shirt for \$19.90 _____
 c) a jacket for \$155.99 _____
 d) a pair of jeans for \$77.80 _____

3. A fish tank that costs \$159.90 is on sale for 40% off.

- a) What is the sale price? _____
 b) What is the final price, including 14% tax?

4. Complete the following chart.

	Item	Price	Discount	Amount Off	Sale Price
a)	shirt	\$ 35.50	30%		
b)	jeans	\$ 89.99	25%		
c)	jacket	\$149.90	40%		
d)	tank top	\$ 13.50	45%		

At-Home Help

To calculate a percent of a decimal, you can rewrite the problem as a proportion. For example, what is 20% of 42.3?

$$\frac{20}{100} = \frac{?}{42.3}$$

$\times ?$
 $\times ?$

I need a number that I can multiply 100 by to get 42.3.

$$100 \times \underline{\quad} = 42.3$$

I can't solve this, but I can rewrite it as a division and use my calculator.

$$42.3 \div 100 = 0.423$$

I multiplied the numerator and denominator of $\frac{20}{100}$ by 0.423.

$$\frac{20}{100} = \frac{8.46}{42.3}$$

$\times 0.423$
 $\times 0.423$

The answer is 8.46.

4.7 Solve Problems Using Logical Reasoning

GOAL

Solve problems that involve percent using logical reasoning.

1. Complete the chart using mental math.

	Number	10%	20%	60%
a)	500			
b)	250			
c)	340			
d)	900			
e)	3500			

2. Explain why each statement is reasonable.

a) 10% of 100 is 10. So, 15% of 100 is 15.

b) 50% of 60 is 30. So, 25% of 60 is 15.

3. Use mental math to answer each problem.

a) There are 340 students at Park Meadows School. If 15% of the students are in Grade 5, how many students are in Grade 5?

b) A CD costs \$23.00 and is 20% off. What is the sale price?

c) 25% of a number is 200. What was the original number?