

# Percents

Introduction: Percent (%) means per hundred or hundredths. When you read in the newspaper that 80% of the voters voted, it means that 80 out of 100 eligible citizens voted. A percent can be considered as a ratio of a number to 100. Remember: 100% of something is all of it.

Percent is very useful in giving a quick comparison on a scale from 1 to 100. For example, when a basketball player has a 75% success rate in making foul shots, we immediately understand that the player is successful at the rate of 75 out of every 100 attempts. In business, a storekeeper may make a 35% profit on sales. A bank may pay  $6\frac{1}{2}\%$  interest on a savings account. A student may receive 84% on a test. As you can see, percentages are part of every day life. The following pages will review the basic concept of percents.

## **Part 1**      **Writing percents as decimals. How to change a percent to a decimal.**

1. Drop the % sign.
2. Move the decimal point 2 places to the left.

Examples.      Change the following percents to decimals.

1. Write 25% as a decimal.

$$25\% = 0.25$$

answer: 0.25

Remember: When there is no decimal point, It is always understood to be to the right of the number.

2. Write 8% as a decimal.

Write 1 zero.

$$8\% = 0.08$$

answer: 0.08

Write zeros if necessary when you move the decimal point.

3. Write 0.7% as a decimal.

Write 2 zeros.

$$0.7\% = 0.007$$

answer: 0.007

Write zeros if necessary when you move the decimal point.

4. Write 9.75% as a decimal.  
Write 1 zero.

$$9.75\% = 0.0975$$

Write zeros if necessary when you move the decimal point.

5. Write  $1\frac{3}{4}\%$  to a decimal.

$$1\frac{3}{4}\% = 1.75\%$$

$$1.75\% = 0.0175$$

Write the fraction as a decimal. Replace in the original number. Then move the decimal point two places to the left.

$$\frac{3}{4} = 4\overline{)0.75}$$

**Part 2**      **Writing decimals as percents.**  
**How to change a decimal or whole number to a percent.**

1. Move the decimal point 2 places to the right.
2. Add the percent sign.

Examples.      Change the following decimals to percents.

1. Write 0.04 as a percent.  
 $0.04 = 0.04$   
 answer: 4%

5. Write 2.125 as a percent.  
 $2.125 = 2.125$   
 answer: 212.5%

2. Write 6 as a percent.  
 Write 2 zeros.  
 $\downarrow$   
 $6 = 6.00$   
 answer: 600%

6. Write 0.6 as a decimal.  
 Write 1 zero.  
 $\downarrow$   
 $0.6 = 0.60$   
 answer: 60%

3. Write 0.125 as a percent.  
 $0.125 = 0.125$   
 answer: 12.5%

7. Write 50 as a decimal.  
 Write 2 zeros.  
 $\downarrow$   
 $50 = 50.00$   
 answer: 5000%

4. Write  $0.04\frac{3}{4}$  as a percent.

$$0.04\frac{3}{4} = 0.0475$$

Sometimes you may see it written as  $4\frac{3}{4}\%$  where the fraction is part of the answer.

answer: 4.75 %

**Practice Part 1 and Part 2**

Write each percent as a decimal.

1. 5%
2. 9%
3. 15%
4. 25%
5. 250%
6. 12.5%
7. 15.25%
8. 0.3%
9.  $0.2\frac{1}{4}\%$
10.  $0.01\frac{1}{2}\%$

Write each decimal or whole number as a percent.

11. 25
12. 520
13. 4
14. 6
15. 0.5
16. 0.53
17. 0.125
18. 0.03
19.  $0.02\frac{1}{2}$
20.  $0.003\frac{1}{4}$

Practice Part 1 and Part 2 Answer Sheet  
Write each percent as a decimal.

1. 5%            **0.05**
2. 9%            **0.09**
3. 15%           **0.15**
4. 25%           **0.25**
5. 250%           **2.5**
6. 12.5%           **0.125**
7. 15.25%           **0.1525**
8. 0.3%           **0.003**
9.  $0.2\frac{1}{4}\%$            **0.225% = 0.00225**
10.  $0.01\frac{1}{2}\%$            **0.015% = 0.00015**

Write each decimal or whole number as a percent.

11. 25            **2500%**
12. 520           **52000%**
13. 4             **400%**
14. 6             **600%**
15. 0.5           **50%**
16. 0.53           **53%**
17. 0.125           **12.5%**
18. 0.03           **3%**
19.  $0.02\frac{1}{2}$            **0.025% = 2.5%**
20.  $0.003\frac{1}{4}$            **0.00325% = 0.325**

**Part 3**      **Writing percents as fractions.**  
**How to change a percent to a fraction.**

1. Drop the percent sign.
2. Write the given number as the numerator and 100 as the denominator.
3. Simplify by reducing. Refer to the fraction section to review reducing fractions.

Examples.      Write each percent as a fraction.

1. Write 8% as a fraction.

$$8\% = \frac{8}{100} = \frac{2}{25}$$

answer:  $\frac{2}{25}$

4. Write 25% as a fraction.

$$25\% = \frac{25}{100} = \frac{1}{4}$$

answer:  $\frac{1}{4}$

2. Write 150% as a fraction or mixed number.

$$150\% = \frac{150}{100} = 1\frac{50}{100} = 1\frac{1}{2}$$

answer:  $1\frac{1}{2}$

5. Write 160% as a fraction.

$$160\% = \frac{160}{100} = 1\frac{60}{100} = 1\frac{3}{5}$$

answer:  $1\frac{3}{5}$

3. Write  $33\frac{1}{3}\%$  as a fraction.

$$33\frac{1}{3}\% = \frac{33\frac{1}{3}}{100} = 33\frac{1}{3} \div 100$$

$$\frac{100}{3} \times \frac{1}{100} = \frac{1}{3}$$

answer:  $\frac{1}{3}$

6. Write  $66\frac{2}{3}\%$  as a fraction.

$$66\frac{2}{3}\% = \frac{66\frac{2}{3}}{100} = 66\frac{2}{3} \div 100$$

$$\frac{200}{3} \times \frac{1}{100} = \frac{2}{3}$$

answer:  $\frac{2}{3}$

Note: Refer to the fraction section to divide mixed numbers.

**Part 4**      **Writing fractions and mixed numbers as percents.**  
**How to change a fraction to a percent.**

1. Divide the numerator (top number) by the denominator (bottom number).
2. Change the decimal to a percent. Remember: Move the decimal point 2 places to the right. (Refer to part 2 for help.)

Examples. Write the following fractions and mixed numbers as a percent.

1. Write  $\frac{3}{4}$  as a percent.

$$\frac{3}{4} = 4 \overline{)3} = 4 \overline{)3.00} = 0.75$$

$$0.75 = 75\%$$

answer: 75%

3. Write  $\frac{3}{2}$  as a percent.

$$\frac{3}{2} = 2 \overline{)3} = 2 \overline{)3.0} = 1.5$$

$$1.5 = 150\%$$

answer: 150%

2. Write  $\frac{1}{5}$  as a percent.

$$\frac{1}{5} = 5 \overline{)1} = 5 \overline{)1.0} = 0.2$$

$$0.2 = 20\%$$

answer: 20%

Note: If there is a remainder after you have tried to divide the third time, stop after 2 places and write the remainder as a fraction. This will happen in example 4 below. If your problem will divide evenly on the third time, go ahead and divide. Your answer will contain three decimal places. Refer to example 5 below.

4. Write  $\frac{1}{9}$  as a percent.

$$\frac{1}{9} = 9 \overline{)1} = 9 \overline{)1.00} =$$

$$0.11\frac{1}{9} = 11\frac{1}{9}\%$$

answer:  $11\frac{1}{9}\%$

5. Write  $\frac{1}{8}$  as a percent.

$$\frac{1}{8} = 8 \overline{)1} = 8 \overline{)1.000}$$

$$0.125 = 12.5\%$$

answer: 12.5%

### Practice Part 3 and Part 4

Write each percent as a fraction.

1. 6%
2. 30%
3. 45%
4. 175%
5. 200%
6.  $33 \frac{1}{3}$  %
7.  $11 \frac{1}{9}$  %

Write each fraction or mixed number as a percent.

- |                   |                   |
|-------------------|-------------------|
| 1. $\frac{3}{5}$  | 6. $\frac{5}{4}$  |
| 2. $\frac{9}{10}$ | 7. $\frac{1}{16}$ |
| 3. $\frac{2}{5}$  | 8. $\frac{3}{4}$  |
| 4. $\frac{1}{3}$  | 9. $\frac{2}{3}$  |
| 5. $\frac{5}{8}$  | 10. $\frac{4}{5}$ |

### Practice Part 3 and Part 4 Answer Sheet

Write each percent as a fraction.

1. 6%  $\frac{6}{100} = \frac{3}{50}$

2. 30%  $\frac{30}{100} = \frac{3}{10}$

3. 45%  $\frac{45}{100} = \frac{9}{20}$

4. 175%  $\frac{175}{100} = 1\frac{75}{100} = 1\frac{3}{4}$

5. 200%  $\frac{200}{100} = 2$

6.  $33\frac{1}{3}\%$   $\frac{1}{3}$  See example 3, p3.

7.  $11\frac{1}{9}\%$   $\frac{1}{9}$  See example 4, part 4.

Write each fraction or mixed number as a percent.

1.  $\frac{3}{5} = 5\overline{)3.0} = 0.6 = 60\%$

6.  $\frac{5}{4} = 4\overline{)5.00} = 1.25 = 125\%$

2.  $\frac{9}{10} = 10\overline{)9.0} = 0.9 = 90\%$

7.  $\frac{1}{16} = 16\overline{)0.06} = 0.06\frac{4}{16} = 6\frac{1}{4}\%$   
 $\frac{96}{4}$

3.  $\frac{2}{5} = 5\overline{)2.0} = 0.4 = 40\%$

8.  $\frac{3}{4} = 4\overline{)3.00} = 0.75 = 75\%$

4.  $\frac{1}{3} = 3\overline{)1.00} = 0.33\frac{1}{3} = 33\frac{1}{3}\%$

9.  $\frac{2}{3} = 66\frac{2}{3}\%$  See examples.

5.  $\frac{5}{8} = 8\overline{)5.000} = 0.625 = 62.5\%$

10.  $\frac{4}{5} = 5\overline{)4.0} = 0.8 = 80\%$



**Part 5**      **Finding a Percent of a Number**

Finding a percent of a number means to multiply. The word “of” in a problem means to multiply. Before multiplying, you must change the percent (%) to a decimal or fraction.

Helpful Hint: Here are the 4 steps in building skills to solve problems.

1. **READ** the problem carefully. What is the question asking? Look for the given facts.
2. **PLAN** how to solve the problem. Choose what you need to do. Will I multiply, divide, add or subtract? In dealing with percents, if you are finding a percent of a number, you must change the percent to a decimal or fraction and multiply.
3. **WRITE** out your plan. Look at the given information again. Sometimes putting the question into words helps you to see how to solve the problem. You can write an equation if one is not given to solve your problem.
4. **FIND THE ANSWER.** Actually work out the problem to get an answer. Always check to see if the answer makes sense. And, always label your answer with the correct unit, if given. Good-luck.

Examples.      Finding a percent of a number.

1. Find 25% of 120.  
Change 25% to a decimal.

$$25\% = 0.25 = 0.25$$

Reminder: The word “of” means multiply.

Remember to move the decimal point 2 places to the left.

Multiply the given number  
and the decimal.

$$\begin{array}{r} 120 \\ \times 0.25 \\ \hline 600 \\ 240 \\ \hline 30.00 \end{array}$$

Remember: You must place a decimal point in your answer. The number of decimal places in your answer is equal to the sum of the decimal points in the factors (the numbers you multiplied).

answer: 30

You can drop the zeros to the right of the decimal point and get just 30.

2. Find 0.5% of 42.  
 Change 0.5% to a decimal.  
 $0.5\% = 0.005 = 0.005$   
 Multiply the given number and the decimal.

$$\begin{array}{r} 42 \\ \times 0.005 \\ \hline 0.210 \end{array}$$

Answer:  $0.210 = 0.21$

You can drop the zero at the end of the number and get 0.21.

3. Find  $12\frac{1}{2}\%$  of 96.  
 Change the percent to a decimal.

$$12\frac{1}{2}\% = 0.12\frac{1}{2} = 0.125$$

$$\text{Remember: } \frac{1}{2} = 2 \overline{)1.0}^{0.5}$$

Multiply the given number and the decimal.

$$\begin{array}{r} 96 \\ \times 0.125 \\ \hline 480 \\ 1920 \\ \hline 9600 \\ 12.000 \end{array}$$

Answer: 12.000 or 12

3. Find 40% of 0.12.  
 Change 40% to a decimal.  
 $40\% = 0.40 = 0.4$   
 Multiply the given number and the decimal.

$$\begin{array}{r} 0.12 \\ \times 0.4 \\ \hline 48 = 0.048 \end{array}$$

Answer: 0.048

Remember: If there are not enough decimal places in the answer, write a zero (or zeros) to the left in the answer. Then add the decimal point.

4. Find 35% of 220.  
 Change 35% to a decimal.  
 $35\% = 0.35 = 0.35$   
 Multiply the given number  
 and the decimal.

$$\begin{array}{r} 220 \\ \times 0.35 \\ \hline 1100 \\ \underline{660} \\ 77.00 \end{array}$$

Answer: 77.00 or 77

5. Find  $\frac{3}{4}\%$  of 450.  
 Change  $\frac{3}{4}\%$  to a decimal.

Remember:

$$\frac{3}{4} = 4\overline{)3} = 4\overline{)3.00} = 0.75$$

$\frac{3}{4}\% = 0.75\% = 0.0075$   
 Multiply the given number  
 and the decimal.

$$\begin{array}{r} 450 \\ \times 0.0075 \\ \hline 2250 \\ \underline{3150} \\ 3.37500 \end{array}$$

Answer: 3.37500 or 3.375

6. Find 7.25% of \$25.95 to the nearest cent.

Change the percent to a decimal.

$$7.25\% = 0.0725$$

Multiply the given dollar amount and the decimal.

Remember: When finding the percent of dollars and cents, you must round the answer to the nearest cent (hundredths place). Refer to rounding decimals.

$$\begin{array}{r} \$25.95 \\ \times 0.0725 \\ \hline 12975 \\ 51900 \\ \hline 1816500 \\ 1.881375 = \$1.88 \end{array}$$

Answer: \$1.88

7. You can also have this type of problem written as an equation in which you are to find the percent of a number.

Solve the equation: 40% of 52 = n.

Change the percent to a decimal and multiply.

$$40\% = 0.40 = 0.4$$

$$\begin{array}{r} 52 \\ \times 0.4 \\ \hline 20.8 \end{array}$$

answer: 20.8

8. Find 112% of 250.

Change the percent to a decimal.

$$112\% = 1.12$$

Multiply the given number and the decimal.

Note: When the percent is greater than 100%, the answer will be greater than the original given number.

$$\begin{array}{r} 250 \\ \times 1.12 \\ \hline 500 \\ 2500 \\ \hline 25000 \\ 280.00 = 280 \end{array}$$

Answer: 280

**Practice Part 5**

1. Find 25% of 84.
2. Find 22.4% of 72.
3. Sue spent 52% of her allowance for a CD. If her allowance was \$9.00, find how much she spent for the CD.
4. This year the Garcia Family spent 15% of what they spent last year for clothes. If they spent \$1,000 last year for clothes, what did they spend this year?
5. Juan saved 25% of the money he earned last week. If Juan earned \$140, how much did he save?
6. Ms. Arn is a salesperson for Smith's Used Cars. She earns a commission of 9% of each sale. How much commission did she earn of the sale for a \$2,400 car?
7. Mrs. Brown earns a 7% commission on her sales. She sold \$240 worth of merchandise on Tuesday, \$300 on Wednesday, and \$190 on Thursday. Find the commission on her total sales for these three days.
8. Find 7  $\frac{1}{2}$  % of \$25.95.
9. 25% of the Jones family budget is to buy food. If their monthly income is \$1500, how much can they spend on food?
10. The Hunter family budget allows 35% for housing, 25% for food, 15% for clothing, 9% for transportation, 10% for entertainment, and 6% for savings. If the Hunter monthly income is \$1,350, how much is spent on both food and clothing?

### Practice Part 5 Answer Sheet

1. 21.00 or 21                      Change 25% to a decimal and multiply.
2. 16.128                              Change 22.4% to a decimal and multiply.
3. \$4.68                                Change 52% to a decimal and multiply.
4. \$150.00                            Change 15% to a decimal and multiply.
5. \$35.00                              Change 25% to a decimal and multiply.
6. \$216.00                            Change 9% to a decimal and multiply.
7. \$51.10                              Find the total. Change 7% to a decimal.  
Then multiply.
8. \$1.88                                Change 7  $\frac{1}{4}$  % to a decimal (  $7.25\% = 0.075$ ).  
Multiply. Round your answer to the nearest cent.
9. \$375.00                            Change 25% to a decimal and multiply.
10. \$540.00                            Add the percents for food and clothing. Change this  
total to a decimal. Then multiply.

**Part 6**      **Finding what percent one number is of another.**

To solve percent problems involving finding what percent one number is of another, you can use the percent formula.

Percent Formula

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

1. Read the problem and substitute the **is** and **of** numbers in the percent formula.
2. Reduce the fraction **is/of**, if possible.
3. Cross multiply.
4. Divide by the coefficient of n. (coefficient is the number in front on **n**.)

Examples.      Finding what percent one number is of another number.

1.      12 is what percent of 16?  
          12 = is (number next to is)  
          16 = of (number next to of)

Hint: If you are looking for the percent, sometimes it is easier to reduce the fraction **is/of** before substituting in the percent formula. Then use this fraction and put it in the formula. Study example 1.

$$\frac{\text{(is)}}{\text{(of)}} \frac{12}{16} = \frac{n}{100} \frac{(\%)}{(100)} \quad \text{Hint: Reduce } \frac{12}{16} = \frac{3}{4} \quad \text{Substitute } \left(\frac{3}{4}\right) \text{ for } \frac{12}{16}$$

$$\left(\frac{3}{4}\right) = \frac{n}{100} \quad \text{Cross Multiply.}$$

$$3 \times 100 = 4 \times n$$

$$300 = 4n \quad \text{Divide.}$$

$$\frac{300}{4} = \frac{4n}{4}$$

$$75 = n$$

$$4 \overline{)300} \begin{array}{r} 75 \\ \underline{280} \\ 200 \\ \underline{200} \\ 0 \end{array}$$

answer: 75%

Don't forget to add the percent sign (%).

11. 3 is what percent of 10?

Write the percent formula.  $\frac{3}{10} = \frac{n}{100}$

Cross multiply.  $3 \times 100 = 10 \times n$   
 $300 = 10n$

Divide.  $\frac{300}{10} = \frac{10n}{10}$

$$30 = n \qquad 10 \overline{)300}$$

answer: 30%      Add the percent sign.

12. 18 is what percent of 12?

Write the percent formula.  $\frac{18}{12} = \frac{n}{100}$       Note: You could have reduced

$\frac{18}{12}$  and used  $\frac{3}{2}$  in the formula.

Cross multiply.  $18 \times 100 = 12 \times n$   
 $1800 = 12n$

Divide.  $\frac{1800}{12} = \frac{12n}{12} \rightarrow 150 = n$        $12 \overline{)1800}$

answer: 150%

Note: If the is part is greater than the of part, the percent will be greater than 100.

13. What percent of 45 is 45?

Write the percent formula.  $\frac{45}{45} = \frac{n}{100}$

Cross multiply.  $4500 = 45n$

Divide.  $\frac{4500}{45} = \frac{45n}{45}$   
 $100 = n$

answer: 100%

Note: If the is and of parts are the same, the fraction  $\frac{45}{45}$  reduces to 1 and this means 100 percent. 100% of something is all of it.



### Practice Part 6

1. What % of 40 is 8?
2. What % of 1500 is 120?
3. What percent of 42 is 42?
4. 100 is what percent of 40?
5. Of the 600 bolts that Mr. Brown inspected, 9 were defective. What percent of the bolts were defective?
6. 175 students at South High School were on the honor roll. If there are 1400 students enrolled, what percent of the students were on the honor roll?
7. In an NBA playoff game with the Los Angeles Lakers, Iverson made 17 of 25 attempted free throws. What percent of free throws did he make?
8. Phil has 40 stamps. Twenty-four of these are from foreign countries. What percent of his stamps are **not** from foreign countries?
9. 5 is what percent of 75?
10. 22.8 is what percent of 200?

### Practice Part 6 Answers

1. 20%
2. 8%
3. 100%
4. 250%
5. 1.5%
6. 12.5%
7. 68%
8. 40%
9.  $6\frac{2}{3}\%$
10. 11.4%

Hint: Subtract  $40 - 24$  to get 16 stamps that are not from foreign countries. Then find what percent of 40 is 16.

**Part 7**      **Finding a number when a percent is known.**

To solve these types of problems, you can use the percent formula here also. Refer to page 11 if you need to review the formula.

Percent Formula

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

1. Read the problem and substitute the **is** and the **percent** in the formula. Note: The **of** part of the problem will be the missing part and will be represented by **n** in the formula.
2. Cross multiply.
3. Divide by the coefficient of **n**.

Examples.      Finding a number when a percent is known.

1. 20% of what number is 50?

Write the percent formula.       $\frac{\text{(is)}}{\text{(of)}} \frac{50}{n} = \frac{20}{100} \frac{\text{(\%)}}{\text{(100)}}$

Cross multiply.       $50 \times 100 = 20 \times n$   
 $5000 = 20n$

Divide.       $\frac{5000}{20} = \frac{20n}{20}$        $20 \overline{)5000} \begin{array}{r} 250 \end{array}$

answer:       $n = 250$

2. 35% of what number is 70?

Write the percent formula.       $\frac{\text{(is)}}{\text{(of)}} \frac{70}{n} = \frac{35}{100} \frac{\text{(\%)}}{\text{(100)}}$

Cross multiply.       $70 \times 100 = 35 \times n$   
 $7000 = 35n$

Divide.       $\frac{7000}{35} = \frac{35n}{35}$        $35 \overline{)7000} \begin{array}{r} 200 \end{array}$

answer:       $n = 200$

Remember: You could have reduced  $\frac{20}{100}$  to  $\frac{1}{5}$  in number 1 **and**

$\frac{35}{100}$  to  $\frac{7}{20}$  in number 2.

3. 4 is 0.5% of what number?

Write the percent formula.  $\frac{\text{(is)}}{\text{(of)}} \frac{4}{n} = \frac{0.5}{100} \frac{(\%)}{(100)}$

Cross multiply.  $4 \times 100 = 0.5 \times n$   
 $400 = 0.5n$

Divide.  $\frac{400}{0.5} = \frac{0.5n}{0.5}$   $0.5 \overline{)400.0} \begin{array}{r} 800. \\ \underline{400.0} \\ 0 \end{array}$

answer:  $n = 800$

4. 15 is 125% of what number?

Write the percent formula.  $\frac{\text{(is)}}{\text{(of)}} \frac{15}{n} = \frac{125}{100} \frac{(\%)}{(100)}$

Cross multiply.  $15 \times 100 = 125 \times n$   
 $1500 = 125n$

Divide.  $\frac{1500}{125} = \frac{125n}{125}$   $125 \overline{)1500} \begin{array}{r} 12 \\ \underline{1500} \\ 0 \end{array}$

answer:  $n = 12$

5.  $\frac{3}{4}$ % of what number is 27?

Write the percent formula.  $\frac{\text{(is)}}{\text{(of)}} \frac{27}{n} = \frac{\frac{3}{4}}{100} \frac{(\%)}{(100)}$

Cross multiply.  $27 \times 100 = \frac{3}{4} \times n$

$2700 = \frac{3}{4}n$  Change  $\frac{3}{4}$  to a decimal.  $0.75 \overline{)3600} \begin{array}{r} 3600. \\ \underline{2700.0} \\ 900.0 \\ \underline{900.0} \\ 0 \end{array}$

Divide.  $\frac{2700}{0.75} = \frac{2700n}{0.75}$   $0.75 \overline{)2700.00} \begin{array}{r} 3600. \\ \underline{2700.00} \\ 0 \end{array}$

answer:  $n = 3600$

### Practice Part 7

1. 30 is 25% of what number?
2. 57 is 100% of what number?
3. 35% of what number is 70?
4. 16 is 8% of what number?
5. Thirty-five percent of Mrs. Brown's grocery bill was spent for meat. If she spent \$14.70 for meat, how much was her grocery bill?
6. Forty-five percent of Metro Tech's enrollment is women. If there are 270 women enrolled, how many total students are enrolled at Metro Tech?
7. 4 is 0.5% of what number?
8. The 8% tax on Joe's bill came to \$2.60. What was the amount of the bill?
9.  $\frac{3}{4}$  % of what number is 27?
10. At Green's Auto Body Shop, 15% of all repairs are broken headlights. If Green repaired 48 headlights last month, what was the total number of repairs done at his shop?

### Practice Part 7 Answers

1. 120
2. 57
3. 200
4. 200
5. \$42.00
6. 600 students
7. 800 (look back at #3)
8. \$32.50
9. 3600 (look back at #5)
10. 320 repairs

**Part 8**      **Finding the percent increase or decrease.**

1. Read the problem and decide if there is an increase or a decrease.
2. Subtract to find the increase or decrease from the original amount.
3. Use the adjusted percent formula.

Adjusted percent formula

$$\frac{\text{amount of increase or decrease}}{\text{original amount}} = \frac{\%}{100}$$

4. Write the percent formula.
5. Cross multiply.
6. Divide.

Examples.

1. Find the percent increase from 8 to 10.

Subtract to find the increase.  $10 - 8 = 2$ .

Write the percent formula using the increase.  $\frac{2}{8} = \frac{n}{100}$

Cross multiply.  $2 \times 100 = 8 \times n$   
 $200 = 8n$

Divide.  $\frac{200}{8} = \frac{8n}{8}$   
 $25 = n$

answer: 25%      Don't forget to add the % sign.

2. Find the percent decrease from 300 to 240.

Subtract to find the decrease.  $300 - 240 = 60$ .

Write the percent formula using the decrease.  $\frac{60}{300} = \frac{n}{100}$

Cross multiply.  $60 \times 100 = 300 \times n$   
 $6000 = 300n$

Divide.  $\frac{6000}{300} = \frac{300n}{300}$   
 $20 = n$

answer: 20% Don't forget to add the % sign.

3. Last year John Smith drove 12,000 miles for business. This year he drove 18,000 miles. What is the percent of increase in mileage?

Read the problem and decide if there is an increase or decrease.

Subtract to find the increase.  $18,000 - 12,000 = 6,000$  miles increase

Identify the original amount: 12,000 (the amount from last year)

Write the percent formula using the increase.  $\frac{\text{(increase)}}{\text{(original amount)}} = \frac{6000}{12000} = \frac{n}{100}$  (percent)

Cross multiply.  $6000 \times 100 = 12,000 \times n$   
 $600,000 = 12,000n$

Divide.  $12000 \overline{)600000} \begin{array}{r} 50 \\ \underline{600000} \\ 0 \end{array}$  ←  $\frac{600,000}{12,000} = \frac{12,000n}{12,000}$   
 $50 = n$

answer: 50% increase Don't forget to add the % sign.

4. A leather coat originally costing \$115 is on sale for \$97.75. What is the percent reduction?

Subtract to find the amount of decrease. \$115.00

- 97.75

\$17.25

Write the percent formula using the decrease.  $\frac{\text{(decrease)}}{\text{(original amount)}} = \frac{17.25}{115} = \frac{n}{100}$  (percent)

Cross multiply.  $17.25 \times 100 = 115 \times n$   
 $1725 = 115n$

Divide.  $115 \overline{)1725} \begin{array}{r} 15 \\ \underline{115} \\ 575 \\ \underline{575} \\ 0 \end{array}$   $\frac{1725}{115} = \frac{115n}{115}$   
 $15 = n$

answer: 15% decrease Don't forget to add the % sign.



### Part 8 Practice

1. Find the percent increase from 8 to 10.
2. Find the percent decrease from 64 to 16.
3. The temperature increased from 60 $^{\circ}$ F to 75 $^{\circ}$ F. Find the percent of increase.
4. Before Bill started his diet, he weighs 180 pounds. Three months later, he weighs 162 pounds. Find the percent decrease in his weight.
5. The price of a radio went from \$35 to \$42. Find the percent of increase.
6. The number of students in VICA increased from 400 to 500. Find the percent of increase.
7. A TV is on sale for \$807.50. The original cost was \$950.00. Find the percent of discount.
8. Jeff paid \$1500 for a stereo that normally cost \$2250. What percent did he save?
9. Joe had \$5000 in the bank one year ago. Now he has \$8000 in the account. What is the percent of increase in Joe's account?
10. Oklahoma City had 900,000 people in year 2000. The population in 1990 was 750,000. What was the percent increase in population from 1990 to 2000?

### **Part 8 Practice Answers**

1. 25% increase
2. 75% decrease
3. 25% increase
4. 10% decrease
5. 20% increase
6. 25% increase
7. 15% discount
8.  $33\frac{1}{3}$  % savings
9. 60% increase
10. 20% increase