Percent Word Problems

Ratio and proportion method

Here are several aids that will help you solve word problems:

1. Make sure you understand the question that is asked
2. Sort out the information to make a basic percent problem, such as "30% of what is 17?"
3. Sometimes, you will have to subtract or add some of the numbers.
4. The <u>base</u> will always be the original number, price, or total.

Some examples of percent word problems.

A baseball pitcher won 80% of the games he pitched. If he pitched 35 ballgames, how many games did he win?

80% of 35 is what?

$$\frac{80}{100} = \frac{\quad}{35}$$

1. Multiply the opposites

   80 x 35 = 2800

2. Divide by the remaining number

$$100\overline{)2800} \quad 28$$

<u>28 games</u>

Jerry, an electrician, worked 7 months out of the year. What percent of the year did he work? (round answer to the nearest hundredth)

What percent of 12 is 7? 12 months = 1 year

$$\frac{\quad}{100} = \frac{7}{12}$$

1. Multiply the opposites

   7 x 100 = 700

2. Divide by the remaining number

$$12\overline{)700.00} \quad 58.33$$

<u>58.33%</u> (rounded to hundredth)

Sometimes the information needed to solve a percent word problem is not stated directly. You will need to sort out the numbers given in the problem. Organizing all the information into a box format will help you see what numbers you have and what you need.

Some examples.

There are 28 students in a class. Sixteen of those students are men. What percent of the class are women? (Round to the nearest tenth)

Men	%	16
Women	%	12
Total	100%	28

28 total students
-16 men
12 women

12 is what % of 28?

$$\frac{\quad}{100} = \frac{12}{28}$$

1. Multiple the opposites
   100 x 12 = 1200
2. Divide by the remaining number

$$28\overline{)1200.00} \quad 42.85$$

42.9%

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Donovan took a math test and got 35 correct and 10 incorrect answers. What was the percentage of correct answers? (Round to the nearest hundredth)

Correct answers	%	35
Incorrect answers	%	10
Total answers	100%	45

35 correct answers
+10 incorrect answers
45 total answers

35 is what % of 45?

$$\frac{\quad}{100} = \frac{35}{45}$$

1. Multiple the opposites
   100 x 35 = 3500
2. Divide by the remaining number

$$45\overline{)3500.000} \quad 77.777$$

77.78% (rounded to hundredth)

Percent Word Problems

Directions: Set up a basic percent problem. Sometimes you will have to do extra steps to solve the problem. Follow rounding directions. Answers and solutions start on page 6.

1) A student earned a grade of 80% on a math test that had 20 problems. How many problems on this test did the student answer correctly? (round to the nearest whole number)

2) There are 36 carpenters in a crew. On a certain day, 29 were present. What percent showed up for work? (round to the nearest tenth)

3) A metal bar weighs 8.15 ounces. 93% of the bar is silver. How many ounces of silver are in the bar? (round to the nearest thousandth)

4) A woman put $580 into a savings account for one year. The rate of interest on the account was $6\frac{1}{2}\%$. How much was the interest for the year in dollars and cents? (Round to the nearest cent)

5) A student answered 86 problems on a test correctly and received a grade 98%. How many problems were on the test, if all the problems were worth the same number of points? (Round to the nearest whole number)

6) Manuel found a wrecked Trans-Am that he could fix. He bought the car for 65% of the original price of $7200. What did he pay for the car? (Round to nearest dollar)

7) Pamela bought an electric drill at 85% of the regular price. She paid $32.89 for the drill. What was the regular price? (Round to the nearest cent)

8) A crew is made up of 8 men; the rest are women. $66\frac{2}{3}$% of the crew are men. How many people are in the crew?

9) Ben earns $12,800 a year. About 15% is taken out for taxes. How much is taken out for taxes?

10) At a sale, shirts were sold for $15 each. This price was 80% of their original price. What was the original price?

11) There are 32 students in a class. Nine of those students are women. What percent are men? (round to the nearest tenth)

12) The Royals softball team played 75 games and won 55 of them. What percent of the games did they lose? (round to the nearest tenth)

Answer Key

1. $\frac{80}{100} = \frac{\quad}{20}$

Multiply the opposites:

80 x 20 = 1600

Divide by the remaining number:

$$100\overline{)1600}\quad 16$$

<u>16 problems</u>

2. $\frac{\quad}{100} = \frac{29}{36}$

Multiply the opposites:

29 x 100 = 2900

Divide by the remaining number:

$$36\overline{)2900.00}\quad 80.55$$

<u>80.6%</u>

3. $\frac{93}{100} = \frac{\quad}{8.15}$

Multiply the opposites:

93 x 8.15 = 757.95

Divide by the remaining number:

$$100\overline{)757.9500}\quad 7.5795$$

<u>7.580 ounces</u>

4. $\frac{6\,1/2}{100} = \frac{\quad}{580}$

Multiply the opposites:

6 ½ x 580 = 3770

Divide by the remaining number:

$$100\overline{)3770.00}\quad 37.70$$

<u>$37.70</u>

5. $\frac{98}{100} = \frac{86}{\quad}$

Multiply the opposites:

100 x 86 = 8600

Divide by the remaining number:

$$98\overline{)8600.0}\quad 87.7$$

<u>88 problems</u> (rounded to nearest whole)

6. $\frac{65}{100} = \frac{\quad}{7200}$

Multiply the opposites:

65 x 7200 = 468,000

Divide by the remaining number:

$$100\overline{)468000}\quad 4680$$

<u>$4680</u>

7. $\frac{85}{100} = \frac{32.89}{\quad}$

Multiply the opposites:

100 x 32.89 = 3289

Divide by the remaining number:

$$85\overline{)3289.000}\quad 38.694$$

<u>$38.69</u>

8. $\frac{66\frac{2}{3}}{100} = \frac{8}{\quad}$

Multiply the opposites:

100 x 8 = 800

Divide by the remaining number:

$$800 \div 66\tfrac{2}{3} = \frac{800}{1} \div \frac{200}{3} = \frac{\cancel{800}^{4}}{1} \times \frac{3}{\cancel{200}_{1}} = \frac{12}{1}$$

<u>12</u>

9. $\frac{15}{100} = \frac{\quad}{12{,}800}$

Multiply the opposites:

15 x 12,800 = 192,000

Divide by the remaining number:

$$100\overline{)192000}\quad 1920$$

<u>$1920</u>

10. $\frac{80}{100} = \frac{15}{\quad}$

Multiply the opposites:

100 x 15 = 1500

Divide by the remaining number:

$$80\overline{)1500.00}\quad 18.75$$

$18.75

11.

Total	100%	32
Men		23
Women		9

$$32 - 9 = 23$$

$$\frac{\quad}{100} = \frac{23}{32}$$

Multiply the opposites:

100 x 23 = 2300

Divide by the remaining number:

$$32\overline{)2300.00} \quad 71.87$$

71.9%(rounded to nearest tenth)

12.

Total	100%	75
Won		55
Lost		20

$$75 - 55 = 20$$

$$\frac{\quad}{100} = \frac{20}{75}$$

Multiply the opposites:

100 x 20 = 2000

Divide by the remaining number:

$$75\overline{)2000.000} \quad 26.667$$

26.7% games lost (rounded to tenth)