

Translating from English to Math in percent problems:

Percentage problems usually work off of some version of the sentence "(this) is (some percentage) of (that)", which translates to "(this) = (some percentage) \times (that)". You will be given two of the values (or enough information that you can figure two of them out), and then you'll need to pick a variable for the value you don't have, write an equation, and solve for that variable.

Examples:

1. What is 35 % of 70?

First convert the percentage "35%" to the number "0.35". (Remember: When you are doing actual math, you need to use actual numbers. Always convert the percentages to decimals!)

“What” is the thing you are looking for, so we replace it by a variable, “is” means equals so replace with “=”, 35% means .35 and 70 is just 70. The equation is $x = .35 \times 70$

Therefore $x = 24.5$. In English, 35% of 70 is 24.5

2. 14 is what percent of 80?

$$14 = x \times 80$$

$$\frac{14}{80} = x$$

$$x = .175$$

You have to remember to convert the decimal to a percent, so $x = 17.5\%$

In English, 14 is 17.5% of 80.

3. 45% of what is 9?

$$.45 \times x = 9$$

$$x = \frac{9}{.45}$$

$$x = 20$$

In English, 45% of 20 is 9.

Translate from the English to the equation, solve the problem, and write the answer in English.

1. What is 20 % of 75?

6. 3% of what is 1422?

2. What is 75 % of 80?

7. 62 % of what is 2?

3. 18 is what percent of 96?

8. 36 is what percent of 40?

4. 150 is what percent of 120?

9. What is 120% of 50?

5. 80% of what is 200?

10. What is 15% of 86?

11. Out of 75 thousand people, 20% smoke. How many people smoke?
12. You go to a restaurant and the bill is \$86.00. You leave a 15% tip. What is the tip?
13. Out of 40 exam questions you get 36 correct. What percent did you get right?
14. An independent political candidate gets 3% of the vote. She received 1422 votes. What was the total number of votes cast?
15. A retail store buys wholesale and then increases the wholesale price by 50%. If an item cost \$120.00 wholesale, what is the retail price?
16. A store is having a 25% off sale, so all items are reduced by 25%. If the original price of an item is \$80.00, what was the reduced price?
17. Out of a class of 96, 18 fail. What percent fails?
18. 80% of the people in the movie theater turn off their cell phones. 200 people turn their phones off. How many people are in the theater?
19. One year 50 million people have access to digital cable. The next year the number increases by 20%. How many people have access to digital cable the second year?
20. A carton of 2% milk says "38% less fat than regular milk". What percent fat does regular milk have?
21. Match each of the problems 11 – 20 with the first ten problems. Example:
#12 is the same as #10.

Do this in 5 minutes:

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|---------------------------|-------------------------|
| 1. 100% of 75 is _____ | 14. 20% of 80 is _____ |
| 2. 100% of 86 is _____ | 15. 20% of 86 is _____ |
| 3. 100% of 98.6 is _____ | 16. 20% of 130 is _____ |
| 4. 100% of 12.32 is _____ | 17. 20% of 18 is _____ |
| 5. 50% of 86 is _____ | 18. 20% of 55 is _____ |
| 6. 50% of 120 is _____ | 19. 15% of 100 is _____ |
| 7. 50% of 700 is _____ | 20. 15% of 60 is _____ |
| 8. 50% of 35 is _____ | 21. 15% of 80 is _____ |
| 9. 10% of 75 is _____ | 22. 15% of 86 is _____ |
| 10. 10% of 86 is _____ | 23. 15% of 36 is _____ |
| 11. 10% of 163 is _____ | 24. 15% of 70 is _____ |
| 12. 10% of 12.9 is _____ | 25. 15% of 150 is _____ |
| 13. 20% of 20 is _____ | 26. 15% of 16 is _____ |

Homework:

1. In clear plain simple English, explain how you would take 100% of a number, 50% of a number, 10% of a number, 20% of a number and 15% of a number. You should write five complete English sentences, one for each.
2. Find out how many Democrats and Republicans are in the incoming House and Senate. Then find the percent of each.