

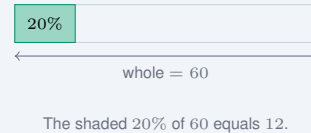
# Percent Problems

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

*Percent* means “out of 100.” To find a percent of a number, change the percent to a decimal by dividing by 100, then multiply. In a word problem the word “of” signals multiplication and “is” signals equals. So “What is 25% of 80?” becomes  $0.25 \times 80$ .

▶ **Example:** What is 20% of 60? **Work:** Change 20% to a decimal:  $20 \div 100 = 0.20$ . Then multiply by 60:  $0.20 \times 60 = 12$ . ★ **Answer:** 12



### Practice Problems

Find each percent of the given number.

- |                    |       |                     |       |
|--------------------|-------|---------------------|-------|
| 1. Find 10% of 90  | _____ | 8. Find 5% of 220   | _____ |
| 2. Find 25% of 80  | _____ | 9. Find 60% of 35   | _____ |
| 3. Find 50% of 46  | _____ | 10. Find 12% of 50  | _____ |
| 4. Find 15% of 200 | _____ | 11. Find 80% of 95  | _____ |
| 5. Find 30% of 70  | _____ | 12. Find 100% of 37 | _____ |
| 6. Find 40% of 150 | _____ | 13. Find 35% of 40  | _____ |
| 7. Find 75% of 48  | _____ | 14. Find 90% of 120 | _____ |

### Word Problems

15. A jacket costs \$80. It is on sale for 25% off. How much money is taken off the price? \_\_\_\_\_
16. A class has 30 students, and 40% of them ride the bus. How many students ride the bus? \_\_\_\_\_
17. A restaurant bill is \$45. You want to leave a 20% tip. How much is the tip? \_\_\_\_\_
18. A water tank is 60% full. If it holds 250 gallons when full, how many gallons are in it now? \_\_\_\_\_



## Answer Keys

- |                                                                                           |                                                                                            |                                                                                                     |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">9</span>  | 7. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">36</span>  | 13. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">14</span>          |
| 2. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">20</span> | 8. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">11</span>  | 14. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">108</span>         |
| 3. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">23</span> | 9. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">21</span>  | 15. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">\$20</span>        |
| 4. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">30</span> | 10. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">6</span>  | 16. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">12 students</span> |
| 5. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">21</span> | 11. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">76</span> | 17. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">\$9</span>         |
| 6. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">60</span> | 12. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">37</span> | 18. <span style="border: 1px solid black; border-radius: 50%; padding: 2px 5px;">150 gallons</span> |

### Step-by-Step Explanations

**1.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Percent means “out of 100,” so 10% becomes the decimal 0.10. Multiply:  $0.10 \times 90 = 9$ . Quick tip: finding 10% just moves the decimal one place left, so 90 turns into 9. So the final answer is 9.

**2.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Rewrite 25% as 0.25, then multiply:  $0.25 \times 80 = 20$ . Since 25% is the same as  $\frac{1}{4}$ , you could also split 80 into four equal parts. So the final answer is 20.

**3.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Half of an amount is 50%. Write it as 0.50 and multiply:  $0.50 \times 46 = 23$  – exactly 46 shared into two equal halves. So the final answer is 23.

**4.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Change 15% to 0.15 and multiply:  $0.15 \times 200 = 30$ . Here’s a check you can do in your head: 10% of 200 is 20, 5% is half of that (10), and  $20 + 10 = 30$ . So the final answer is 30.

**5.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Write 30% as 0.30 and multiply:  $0.30 \times 70 = 21$ . You can also think of it as three groups of 10%: 10% of 70 is 7, and  $3 \times 7 = 21$ . So the final answer is 21.

**6.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Turn 40% into 0.40 and multiply:  $0.40 \times 150 = 60$ . Or picture four tenths: one tenth of 150 is 15, so  $4 \times 15 = 60$ . So the final answer is 60.

**7.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Because  $75\% = \frac{3}{4}$ , use 0.75:  $0.75 \times 48 = 36$ . You can also take three quarters of 48 directly:  $48 \div 4 = 12$ , then  $3 \times 12 = 36$ . So the final answer is 36.

**8.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Small percents work the same way. Write 5% as 0.05:  $0.05 \times 220 = 11$ . Remember 5% is half of 10%, and 10% of 220 is 22. So the final answer is 11.

**9.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Rewrite 60% as 0.60 and multiply:  $0.60 \times 35 = 21$ . That is six tenths of 35: one tenth is 3.5, so  $6 \times 3.5 = 21$ . So the final answer is 21.

**10.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Change 12% to 0.12:  $0.12 \times 50 = 6$ . A shortcut: 50 is half of 100, so 12% of 50 is just half of 12. So the final answer is 6.

**11.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Write 80% as 0.80:  $0.80 \times 95 = 76$ . As a check, subtract the remaining 20% of 95 (19) from 95 to get 76. So the final answer is 76.

**12.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is 100% means the whole amount, so  $1.00 \times 37 = 37$ . The value stays unchanged. So the final answer is 37.

**13.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Rewrite 35% as 0.35:  $0.35 \times 40 = 14$ . You can break it up too: 25% of 40 is 10, 10% is 4, and  $10 + 4 = 14$ . So the final answer is 14.

**14.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Turn 90% into 0.90:  $0.90 \times 120 = 108$ . Quick check: 120 minus the missing 10% (12) also gives 108. So the final answer is 108.

**15.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A discount is a percent of the original price. Find 25% of \$80:  $0.25 \times 80 = \$20$ , and that \$20 is the amount taken off. So the final answer is \$20.

**16.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is The word “of” tells you to multiply. Find 40% of the 30 students:  $0.40 \times 30 = 12$ , so 12 students ride the bus. So the final answer is 12 students.

**17.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A tip is a percent of the bill. Take 20% of \$45:  $0.20 \times 45 = \$9$ . Since 20% is one fifth,  $45 \div 5 = 9$  works too. So the final answer is \$9.

**18.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is “How full” is a percent of the total capacity. Find 60% of 250:  $0.60 \times 250 = 150$ , so 150 gallons are in the tank. So the final answer is 150 gallons.



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