

# Percent of Increase and Decrease

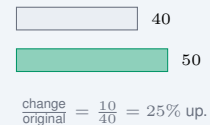
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## Quick Review and Helpful Hints

A percent change compares the *amount of change* to the *original* amount:  $\text{percent change} = \frac{\text{change}}{\text{original}} \times 100\%$ . If the new value is larger it is a percent *increase*; if smaller, a percent *decrease*. Always divide by the original (starting) amount, not the new one.

▷ **Example:** A price rises from \$40 to \$50. Find the percent increase.

**Work:** The change is  $50 - 40 = 10$ . Divide by the original:  $\frac{10}{40} = 0.25$ , then multiply by 100%. ★ **Answer:** 25% increase



### ◆ Practice Problems

Find each percent of increase or decrease.

- |  |  |
|--|--|
| <p>1. 20 → 25 _____</p> <p>2. 50 → 40 _____</p> <p>3. 80 → 100 _____</p> <p>4. 60 → 45 _____</p> <p>5. 10 → 15 _____</p> <p>6. 200 → 150 _____</p> <p>7. 30 → 36 _____</p> | <p>8. 90 → 72 _____</p> <p>9. 25 → 30 _____</p> <p>10. 120 → 90 _____</p> <p>11. 40 → 60 _____</p> <p>12. 75 → 60 _____</p> <p>13. 8 → 10 _____</p> <p>14. 50 → 35 _____</p> |
|--|--|

### ◆ Word Problems

15. A shirt's price went from \$25 to \$30. What is the percent increase? \_\_\_\_\_
16. A town's population grew from 800 to 1000. What is the percent increase? \_\_\_\_\_
17. A \$80 item is marked down to \$60. What is the percent decrease? \_\_\_\_\_
18. A person's weight dropped from 150 lb to 120 lb. What is the percent decrease? \_\_\_\_\_



## Answer Keys

- |                 |                  |                  |
|-----------------|------------------|------------------|
| 1. 25% increase | 7. 20% increase  | 13. 25% increase |
| 2. 20% decrease | 8. 20% decrease  | 14. 30% decrease |
| 3. 25% increase | 9. 20% increase  | 15. 20% increase |
| 4. 25% decrease | 10. 25% decrease | 16. 25% increase |
| 5. 50% increase | 11. 50% increase | 17. 25% decrease |
| 6. 25% decrease | 12. 20% decrease | 18. 20% decrease |

### 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 The amount changes by  $25 - 20 = 5$ , an increase. Compare it to the original:  $\frac{5}{20} = 0.25$ , which is a 25% increase. So the final answer is 25% increase.

**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 The value drops by  $50 - 40 = 10$ . Divide by the original:  $\frac{10}{50} = 0.20$ , a 20% decrease. So the final answer is 20% decrease.

**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 The change is  $100 - 80 = 20$  up. Over the original:  $\frac{20}{80} = 0.25 = 25\%$  increase. So the final answer is 25% increase.

**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 The change is  $60 - 45 = 15$  down. Over the original:  $\frac{15}{60} = 0.25 = 25\%$  decrease. So the final answer is 25% decrease.

**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 The change is 5 up. Over the original:  $\frac{5}{10} = 0.50 = 50\%$  increase. So the final answer is 50% increase.

**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 The change is 50 down. Over the original:  $\frac{50}{200} = 0.25 = 25\%$  decrease. So the final answer is 25% decrease.

**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 The change is 6 up. Over the original:  $\frac{6}{30} = 0.20 = 20\%$  increase. So the final answer is 20% increase.

**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 The change is 18 down. Over the original:  $\frac{18}{90} = 0.20 = 20\%$  decrease. So the final answer is 20% decrease.

**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 The change is 5 up. Over the original:  $\frac{5}{25} = 0.20 = 20\%$  increase. So the final answer is 20% increase.

**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 The change is 30 down. Over the original:  $\frac{30}{120} = 0.25 = 25\%$  decrease. So the final answer is 25% decrease.

**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 The change is 20 up. Over the original:  $\frac{20}{40} = 0.50 = 50\%$  increase. So the final answer is 50% increase.

**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 The change is 15 down. Over the original:  $\frac{15}{75} = 0.20 = 20\%$  decrease. So the final answer is 20% decrease.

**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 The change is 2 up. Over the original:  $\frac{2}{8} = 0.25 = 25\%$  increase. So the final answer is 25% increase.

**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 The change is 15 down. Over the original:  $\frac{15}{50} = 0.30 = 30\%$  decrease. So the final answer is 30% decrease.

**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 The price went up by  $30 - 25 = 5$ . Over the original price:  $\frac{5}{25} = 0.20 = 20\%$  increase. So the final answer is 20% increase.

**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 Growth is  $1000 - 800 = 200$ . Over the original population:  $\frac{200}{800} = 0.25 = 25\%$  increase. So the final answer is 25% increase.

**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 The price dropped by  $80 - 60 = 20$ . Over the original:  $\frac{20}{80} = 0.25 = 25\%$  decrease. So the final answer is 25% decrease.

**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 Weight fell by  $150 - 120 = 30$ . Over the original:  $\frac{30}{150} = 0.20 = 20\%$  decrease. So the final answer is 20% decrease.



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