

# Solving Rate and Ratio Word Problems

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q Quick Review

Many real-world problems are solved by **scaling a ratio up or down**. The key step is to find the **unit rate** first, then multiply by the amount you need. If 3 pens cost \$6, the unit rate is  $\$6 \div 3 = \$2$  per pen, so 7 pens cost  $7 \times \$2 = \$14$ . You can also use a ratio table or set up equivalent ratios. Always check that your units line up and that your answer makes sense — more items should cost more, and faster speeds cover more distance.

◊ **Example:** If 4 notebooks cost \$12, how much do 9 notebooks cost?

⇒ First find the cost of just one notebook — the unit rate. Divide the total cost by the number of notebooks:  $\$12 \div 4 = \$3$  per notebook. Now scale up to 9 notebooks by multiplying:  $9 \times \$3 = \$27$ . Let's check that it makes sense: 9 notebooks is more than 4, so the cost should be more than \$12, and \$27 is.

**Answer:** \$27

## PRACTICE

Solve each problem. Find the unit rate first when it helps.

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| 1. 3 apples cost \$6. Cost of 5 apples? _____    | 12. Types 40 words in 1 min. Words in 9 min? _____               |
| 2. 2 pens cost \$3. Cost of 8 pens? _____        | 13. 5 cups flour per 2 loaves. Flour for 6 loaves? _____         |
| 3. Drives 60 mi in 1 h. Distance in 4 h? _____   | 14. 9 pencils cost \$18. Cost of 4 pencils? _____                |
| 4. 5 pounds cost \$15. Cost of 7 pounds? _____   | 15. Walks 4 mi in 1 h. Time for 20 mi? _____                     |
| 5. Reads 30 pages in 1 h. Pages in 6 h? _____    | 16. 7 chairs per table. Chairs for 8 tables? _____               |
| 6. 4 tickets cost \$20. Cost of 9 tickets? _____ | 17. 12 oranges for \$4. Oranges for \$10? _____                  |
| 7. 6 cans for \$9. Cost of 10 cans? _____        | 18. Fills 6 gal in 2 min. Gallons in 5 min? _____                |
| 8. Bikes 12 mi in 2 h. Distance in 5 h? _____    | 19. 2 teachers per 25 students. Teachers for 100 students? _____ |
| 9. 8 markers cost \$24. Cost of 3 markers? _____ | 20. 15 laps in 3 days. Laps in 7 days? _____                     |
| 10. 3 eggs per cake. Eggs for 7 cakes? _____     |  |
| 11. 10 stickers for \$2. Stickers for \$7? _____ |  |

## ◆ Word Problems

- A market sells 3 pounds of grapes for \$6. At the same rate, how much would 12 pounds of grapes cost? \_\_\_\_\_
- A train travels at a steady 60 miles per hour. How far does it travel in 2 and a half hours? \_\_\_\_\_
- A cookie recipe uses 2 cups of flour for every 3 eggs. If you use 9 eggs, how many cups of flour do you need? \_\_\_\_\_
- 5 identical printers together print 100 pages per minute. How many pages does just 1 printer print per minute? \_\_\_\_\_



## Answer Keys

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|--|--|
| <p>1. \$10</p> <p>2. \$12</p> <p>3. 240 mi</p> <p>4. \$21</p> <p>5. 180 pages</p> <p>6. \$45</p> <p>7. \$15</p> <p>8. 30 mi</p> <p>9. \$9</p> <p>10. 21 eggs</p> <p>11. 35 stickers</p> <p>12. 360 words</p> | <p>13. 15 cups</p> <p>14. \$8</p> <p>15. 5 h</p> <p>16. 56 chairs</p> <p>17. 30 oranges</p> <p>18. 15 gal</p> <p>19. 8 teachers</p> <p>20. 35 laps</p> <p>21. \$24</p> <p>22. 150 miles</p> <p>23. 6 cups</p> <p>24. 20 pages per minute</p> |
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### Step-by-Step Explanations

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| <p>1. Unit rate: <math>6 \div 3 = \\$2</math> each. Then <math>5 \times 2 = \\$10</math>.</p> <p>2. Unit rate: <math>3 \div 2 = \\$1.50</math> each. Then <math>8 \times 1.5 = \\$12</math>.</p> <p>3. At 60 mph, 4 hours covers <math>4 \times 60 = 240</math> miles.</p> <p>4. Unit rate: <math>15 \div 5 = \\$3</math> per pound. Then <math>7 \times 3 = \\$21</math>.</p> <p>5. At 30 pages per hour, <math>6 \times 30 = 180</math> pages.</p> <p>6. Unit rate: <math>20 \div 4 = \\$5</math> each. Then <math>9 \times 5 = \\$45</math>.</p> <p>7. Unit rate: <math>9 \div 6 = \\$1.50</math> each. Then <math>10 \times 1.5 = \\$15</math>.</p> <p>8. Unit rate: <math>12 \div 2 = 6</math> mph. Then <math>5 \times 6 = 30</math> miles.</p> <p>9. Unit rate: <math>24 \div 8 = \\$3</math> each. Then <math>3 \times 3 = \\$9</math>.</p> <p>10. Multiply: <math>7 \times 3 = 21</math> eggs.</p> <p>11. Unit rate: <math>10 \div 2 = 5</math> stickers per dollar. Then <math>7 \times 5 = 35</math>.</p> <p>12. Multiply: <math>9 \times 40 = 360</math> words.</p> | <p>13. 6 loaves is 3 times 2, so <math>3 \times 5 = 15</math> cups.</p> <p>14. Unit rate: <math>18 \div 9 = \\$2</math> each. Then <math>4 \times 2 = \\$8</math>.</p> <p>15. Divide: <math>20 \div 4 = 5</math> hours.</p> <p>16. Multiply: <math>8 \times 7 = 56</math> chairs.</p> <p>17. Unit rate: <math>12 \div 4 = 3</math> oranges per dollar. Then <math>10 \times 3 = 30</math>.</p> <p>18. Unit rate: <math>6 \div 2 = 3</math> gallons per minute. Then <math>5 \times 3 = 15</math>.</p> <p>19. 100 students is 4 times 25, so <math>4 \times 2 = 8</math> teachers.</p> <p>20. Unit rate: <math>15 \div 3 = 5</math> laps per day. Then <math>7 \times 5 = 35</math>.</p> <p>21. Unit rate: <math>\\$6 \div 3 = \\$2</math> per pound. Then <math>12 \times \\$2 = \\$24</math>.</p> <p>22. Multiply the speed by the time: <math>60 \times 2.5 = 150</math> miles.</p> <p>23. 9 eggs is 3 times 3 eggs, so use <math>3 \times 2 = 6</math> cups of flour.</p> <p>24. Divide the total by the number of printers: <math>100 \div 5 = 20</math> pages per minute for one printer.</p> |
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