

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? _____ | |
| 10. 3 eggs per cake. Eggs for 7 cakes? _____ | 20. 15 laps in 3 days. Laps in 7 days? _____ |
| 11. 10 stickers for \$2. Stickers for \$7? _____ | |

◆ Word Problems

21. A market sells 3 pounds of grapes for \$6. At the same rate, how much would 12 pounds of grapes cost? _____
22. A train travels at a steady 60 miles per hour. How far does it travel in 2 and a half hours? _____
23. 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? _____
24. 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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|-----------------|-------------------------|
| 1. \$10 | 13. 15 cups |
| 2. \$12 | 14. \$8 |
| 3. 240 mi | 15. 5 h |
| 4. \$21 | 16. 56 chairs |
| 5. 180 pages | 17. 30 oranges |
| 6. \$45 | 18. 15 gal |
| 7. \$15 | 19. 8 teachers |
| 8. 30 mi | 20. 35 laps |
| 9. \$9 | 21. \$24 |
| 10. 21 eggs | 22. 150 miles |
| 11. 35 stickers | 23. 6 cups |
| 12. 360 words | 24. 20 pages per minute |

Step-by-Step Explanations

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