# Solving Rate and Ratio Word Problems

| Name: _____ | Date: _____ | Score: _____ / 24 |
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## 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.*

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

### 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

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

## Step-by-Step Explanations

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

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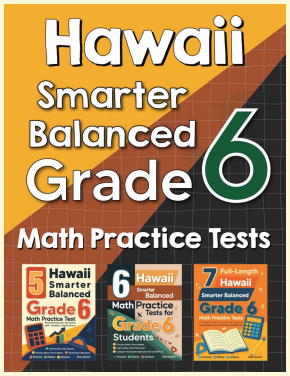


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