Solving Rate and Ratio Word Problems

Name: _____	Date: _____	Score: _____ / 24

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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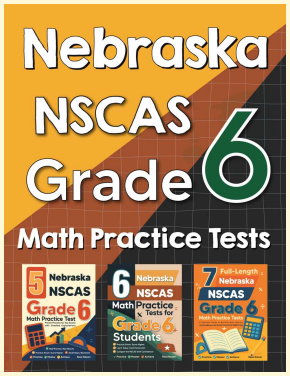

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