Solving Percent Problems

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 10

QUICK REVIEW

Percent means per hundred. Use part $=$ (percent$/100)\times$ whole; divide by that rate to find the whole. For example, 20% of 60 is $(20/100)60 = 12$. The percent number is $12/60 \times 100 = 20$, so the rate is 20%.

Worked example

Example: find 20% of 60.

1. $20\% = \frac{1}{5}$.
2. The part is $60(\frac{1}{5}) = 12$.
3. The rest is $60 - 12 = 48$.
Answer: 12.

Practice Problems

Show your thinking.

1. Library books: find 15% of 100.

2. Club survey: 24 is 30% of what whole?

3. Garden plots: 16 of 40 items meet the goal. What percent is that? Explain why the total, not the qualifying count, is the denominator.

4. Seats: find 30% of 160. Write an equation with an unknown part before evaluating.

5. Team badges: 35 is 25% of what whole? Give a numerical substitution check for the reconstructed whole.

6. Completed puzzles: 27 of 45 items meet the goal. What percent is that?

7. Museum badges: find 45% of 120.

8. Music club: 36 is 40% of what whole?

9. Seed trays: 18 of 24 items meet the goal. What percent is that?

10. Workshop seats: 35% of 200 items are reserved. How many remain unreserved?

Answer Key

1. 15.
2. Total 80.
3. 40%. Percent compares the part with the whole set of 40.
4. $p = (30/100)(160)$. 48.
5. Total 140.
6. 60%.
7. 54.
8. Total 90.
9. 75%.
10. 130 items.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $15\% = \frac{3}{20}$.
2. The part is $100(\frac{3}{20}) = 15$.
3. The rest is $100 - 15 = 85$.

Problem 2

1. Let w be the whole: $(30/100)w = 24$.
2. $w = 24 \div (30/100) = 80$.
3. Check: $(30/100)(80) = 24$; the remainder is $80 - 24 = 56$.

Problem 3

1. The part-to-whole ratio is $16/40 = \frac{2}{5}$.
2. Percent number: $\frac{2}{5} \times 100 = 40$; therefore the rate is 40%.
3. Check $(40/100)(40) = 16$.

Problem 4

1. Part equation: $p = (30/100)(160)$.
2. $30\% = \frac{3}{10}$.
3. The part is $160(\frac{3}{10}) = 48$.
4. The rest is $160 - 48 = 112$.

Problem 5

1. Let w be the whole: $(25/100)w = 35$.
2. $w = 35 \div (25/100) = 140$.
3. Check: $(25/100)(140) = 35$; the remainder is $140 - 35 = 105$.

Problem 6

1. The part-to-whole ratio is $27/45 = \frac{3}{5}$.
2. Percent number: $\frac{3}{5} \times 100 = 60$; therefore the rate is 60%.
3. Check $(60/100)(45) = 27$.

Problem 7

1. $45\% = \frac{9}{20}$.
2. The part is $120(\frac{9}{20}) = 54$.
3. The rest is $120 - 54 = 66$.

Problem 8

1. Let w be the whole: $(40/100)w = 36$.
2. $w = 36 \div (40/100) = 90$.
3. Check: $(40/100)(90) = 36$; the remainder is $90 - 36 = 54$.

Problem 9

1. The part-to-whole ratio is $18/24 = \frac{3}{4}$.
2. Percent number: $\frac{3}{4} \times 100 = 75$; therefore the rate is 75%.
3. Check $(75/100)(24) = 18$.

Problem 10

1. $35\% = \frac{7}{20}$.
2. The part is $200(\frac{7}{20}) = 70$.
3. The rest is $200 - 70 = 130$.

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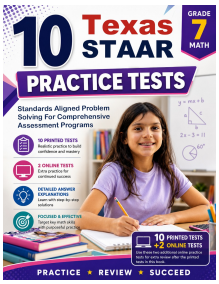

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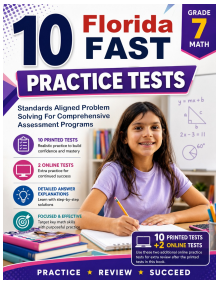

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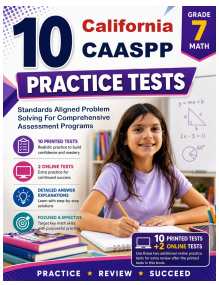

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