Solving Percent Problems

Apply the skill to decisions and designs

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: 15% of 140 items are reserved. How many remain unreserved?

2. Club survey: 36 people represent 30% of all members. Find total membership and members not in this group.

3. Garden plots: 24 of 40 entries qualify. The goal is 60%. Find the qualifying percent and decide whether the goal is met. Explain why the total, not the qualifying count, is the denominator.

4. Seats: 40% of 160 items are reserved. How many remain unreserved? Write an equation with an unknown part before evaluating.

5. Team badges: 35 people represent 25% of all members. Find total membership and members not in this group. Give a numerical substitution check for the reconstructed whole.

6. Completed puzzles: 27 of 45 entries qualify. The goal is 60%. Find the qualifying percent and decide whether the goal is met.

7. Museum badges: 45% of 120 items are reserved. How many remain unreserved?

8. Music club: 36 people represent 40% of all members. Find total membership and members not in this group.

9. Seed trays: 18 of 24 entries qualify. The goal is 60%. Find the qualifying percent and decide whether the goal is met.

10. Workshop seats: Eli says 35% of 200 is 270. Find the correct part and identify the extra operation.

Answer Key

1. 119 items.
2. Total 120; other members 84.
3. 60%; goal met. Percent compares the part with the whole set of 40.
4. $p = (40/100)(160)$. 96 items.
5. Total 140; other members 105.
6. 60%; goal met.
7. 66 items.
8. Total 90; other members 54.
9. 75%; goal met.
10. 70; Eli added the whole to the part.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $15\% = \frac{3}{20}$.
2. The part is $140(\frac{3}{20}) = 21$.
3. The rest is $140 - 21 = 119$.

Problem 2

1. Let w be the whole: $(30/100)w = 36$.
2. $w = 36 \div (30/100) = 120$.
3. Check: $(30/100)(120) = 36$; the remainder is $120 - 36 = 84$.

Problem 3

1. The part-to-whole ratio is $24/40 = \frac{3}{5}$.
2. Percent number: $\frac{3}{5} \times 100 = 60$; therefore the rate is 60%.
3. Compare 60% with 60%: at least the goal.

Problem 4

1. Part equation: $p = (40/100)(160)$.
2. $40\% = \frac{2}{5}$.
3. The part is $160(\frac{2}{5}) = 64$.
4. The rest is $160 - 64 = 96$.

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. Compare 60% with 60%: at least the goal.

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. Compare 75% with 60%: at least the goal.

Problem 10

1. $35\% = \frac{7}{20}$.
2. The part is $200(\frac{7}{20}) = 70$.
3. The reported value is $70 + 200 = 270$; adding the whole was the extra operation, not part of finding the percent part.

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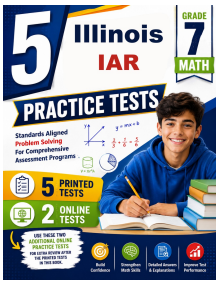

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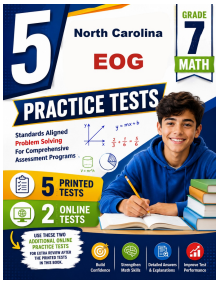

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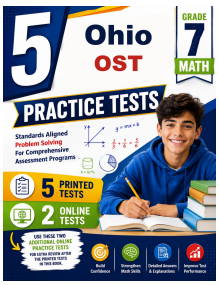

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