Connecting Percents and Proportions

Explore ideas and representations

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

QUICK REVIEW

Write part/whole $= p/100$. Corresponding entries must keep the same order. For 9 out of 12, $9/12 = p/100$ gives $12p = 900$, so $p = 75$ and the proportion is $9/12 = 75/100$.

Worked example

Of 5 beads, 2 are blue. Use a proportion to find the blue percent.

1. From $\frac{2}{5} = \frac{p}{100}$, cross products give $5p = 2(100) = 200$.
2. Divide by 5: $p = 200/5 = 40$.
3. Check the equivalent ratios: $\frac{2}{5} = \frac{40}{100}$.
Answer: 40%.

Practice Problems

Show your thinking.

1. Complete the proportion $\frac{3}{8} = \frac{p}{100}$. Explain the meaning of p.

2. A ribbon has 20 equal sections, with 7 shaded. Write the shaded fraction and equivalent percent proportion.

3. Solve $\frac{x}{25} = \frac{36}{100}$ and check the part x.

4. Complete the proportion $\frac{11}{50} = \frac{p}{100}$. Explain the meaning of p. Also write the complementary proportion for the part outside the group.

5. A ribbon has 20 equal sections, with 13 shaded. Write the shaded fraction and equivalent percent proportion. Check the scale factor by applying it to the whole as well as the part.

6. Solve $\frac{x}{40} = \frac{\frac{85}{2}}{100}$ and check the part x.

7. At two pledge tables, 21 of 60 and 44 of 80 visitors pledge. Use proportions to find the two rates and their gap in percentage points.

8. A club counted 32 finches. Finches were 40% of the birds seen. Write a proportion to find the total.

9. A tray has 80 seedlings. Exactly 35% should be herbs. Use a proportion to find how many are herbs and how many are not.

10. Each of 40 students chooses A, B, or C. If 12 choose A and 25% choose B, use proportions to find the count and percent for C.

Answer Key

1. $\frac{3}{8} = \frac{\frac{75}{2}}{100}$; $\frac{75}{2}\%$. p is the number per hundred.
2. $\frac{7}{20} = \frac{35}{100}$; 35%.
3. $x = 9$.
4. $\frac{11}{50} = \frac{22}{100}$; 22%. p is the number per hundred. Complement $(39)/50 = (78)/100$.
5. $\frac{13}{20} = \frac{65}{100}$; 65%.
6. $x = 17$.
7. 35% and 55%. Table 2 is ahead by 20 percentage points.
8. 80 birds.
9. 28 herbs; 52 other seedlings.
10. 18 students, or 45%.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. From $\frac{3}{8} = \frac{p}{100}$, cross products give $8p = 3(100) = 300$.
2. Divide by 8: $p = 300/8 = \frac{75}{2}$.
3. Check the equivalent ratios: $\frac{3}{8} = \frac{\frac{75}{2}}{100}$. $p = \frac{75}{2}$ means $\frac{75}{2}$ per 100.

Problem 2

1. The scale factor from 20 to 100 is $100/20 = 5$.
2. Scale the part: $7(5) = 35$.
3. The equivalent proportion is $\frac{7}{20} = \frac{35}{100}$.

Problem 3

1. From $\frac{x}{25} = \frac{36}{100}$, cross products give $100x = 25(36) = 900$.
2. Divide by 100: $x = 900/100 = 9$.
3. Check the equivalent ratios: $\frac{9}{25} = \frac{36}{100}$.

Problem 4

1. From $\frac{11}{50} = \frac{p}{100}$, cross products give $50p = 11(100) = 1100$.
2. Divide by 50: $p = 1100/50 = 22$.
3. Check the equivalent ratios: $\frac{11}{50} = \frac{22}{100}$. $p = 22$ means 22 per 100.
4. Remaining part $50 - 11 = 39$; complementary percent number $100 - 22 = 78$, so the share is 78%.

Problem 5

1. The scale factor from 20 to 100 is $100/20 = 5$.
2. Scale the part: $13(5) = 65$.
3. The equivalent proportion is $\frac{13}{20} = \frac{65}{100}$.
4. Whole check: $20(100/20) = 100$.

Problem 6

1. From $\frac{x}{40} = \frac{\frac{85}{2}}{100}$, cross products give $100x = 40(\frac{85}{2}) = 1700$.
2. Divide by 100: $x = 1700/100 = 17$.
3. Check the equivalent ratios: $\frac{17}{40} = \frac{\frac{85}{2}}{100}$.

Problem 7

1. First: $\frac{21}{60} = \frac{p}{100}$ gives $60p = 2100$, so $p = 35$.
2. Second: $\frac{44}{80} = \frac{p}{100}$ gives $80p = 4400$, so $p = 55$.
3. The gap is $55 - 35 = 20$ percentage points.

Problem 8

1. From $\frac{32}{w} = \frac{40}{100}$, cross products give $(40)w = 32(100) = 3200$.
2. Divide by 40: $w = 3200/(40) = 80$.
3. Check the equivalent ratios: $\frac{32}{80} = \frac{40}{100}$.

Problem 9

1. Use $\frac{x}{80} = \frac{35}{100}$; cross products give $100x = 80(35) = 2800$.
2. The exact cutoff is $x = 2800/100 = 28$.
3. The other seedlings number $80 - 28 = 52$.

Problem 10

1. For B, $b/40 = 25/100$ gives $100b = 1000$, so $b = 10$.
2. For C, $40 - 12 - 10 = 18$ students.
3. $18/40 = p/100$ gives $40p = 1800$, so $p = 45$.

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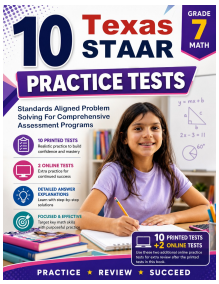

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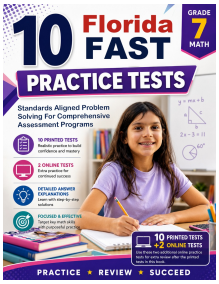

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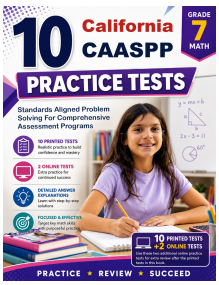

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