

Solving Two-Step Equations with Rational Numbers

Grade 7 math · Test Answer Key · Standards: 7.EE.B.3, 7.EE.B.4a

Award points as marked. Give full credit for any correct method, such as distributing first or dividing first, and allow one point of partial credit when a single arithmetic slip is followed correctly through the remaining steps.

Standards: 7.EE.B.3, 7.EE.B.4a · **Level:** Grade 7

Question 1 Solve Two Equations (2 points)

- a. $6x = 42$, so $x = 7$.
- b. $4x = -24$, so $x = -6$.

Scoring: 1 point per part.

Question 2 A Quotient Equation (2 points)

Add 8: $\frac{x}{5} = 5$. Multiply by 5: $x = 25$. Check: $25 \div 5 - 8 = -3$.

Scoring: 1 point for each correct step.

Question 3 Decimal Coefficients (2 points)

Subtract 1.6: $3.2x = 12.8$. Divide by 3.2: $x = 4$. Check: $3.2(4) + 1.6 = 14.4$.

Scoring: 1 point for each correct step.

Question 4 Two Ways with Parentheses (3 points)

- a. $x - 2.4 = 3.2$, so $x = 5.6$.
- b. $5x - 12 = 16$, so $5x = 28$ and $x = 5.6$.
- c. $5(5.6 - 2.4) = 5(3.2) = 16$. $x = 5.6$.

Scoring: 1 point per part.

Question 5 Fractions in an Equation (3 points)

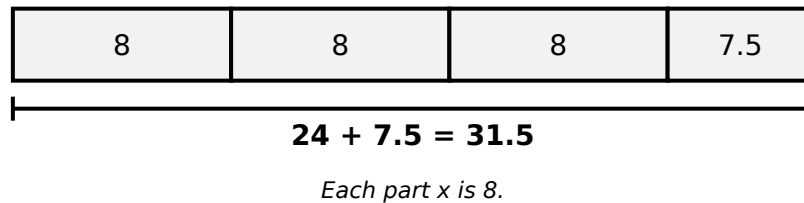
Multiply by $\frac{4}{3}$: $x + \frac{2}{3} = \frac{14}{3}$. Subtract $\frac{2}{3}$: $x = \frac{12}{3} = 4$.

Check: $\frac{3}{4} \cdot \frac{14}{3} = \frac{14}{4} = \frac{7}{2}$.

Scoring: 1 point for the reciprocal step, 1 point for the subtraction, 1 point for the result.

Question 6 Equation from a Diagram (3 points)

- a. $3x + 7.5 = 31.5$.
- b. $3x = 24$, so $x = 8$.
- c. $3(8) + 7.5 = 24 + 7.5 = 31.5$.



Scoring: 1 point per part.

Question 7 Gym Membership (3 points)

- a. $18.50m + 35 = 146$.
- b. $18.50m = 111$, so $m = 6$.
- c. Nia has been a member for 6 months. Check: $18.50(6) + 35 = 111 + 35 = 146$.

Scoring: 1 point per part.

Question 8 Find the Mistake (2 points)

- a. On line 2 he multiplied 18 by 2; the factor 2 should be divided out, not multiplied.
- b. Divide by 2: $x + 5 = 9$, so $x = 4$. Check: $2(4 + 5) = 18$.

Scoring: 1 point per part.