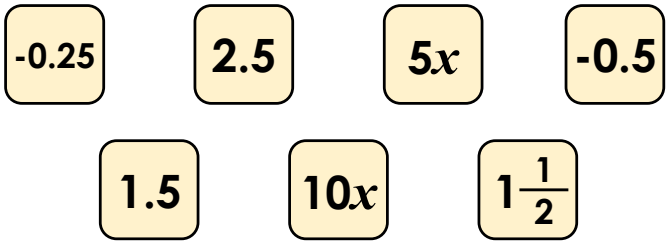
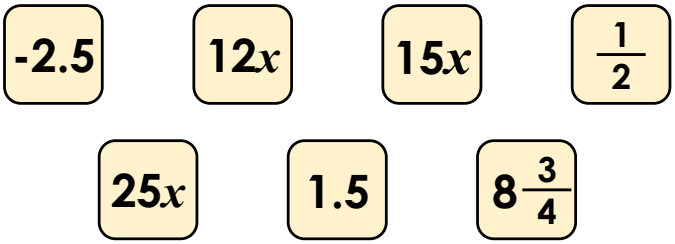
Two-Step Equations

7a. Use the cards below to create three balanced equations where x = 0.2. You must use a different operation in each equation.



GD PS

7b. Use the cards below to create three balanced equations where x = 0.25. You must use a different operation in each equation.



GD PS

8a. Choose a value for y and find three possibilities for each of the following equations.

A. $\square y \div \square = 6.5$

B. $\square y - \square = -2.5$

GD PS

8b. Choose a value for y and find three possibilities for each of the following equations.

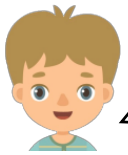
A. $\square y \div \square = 1.75$

B. $\square y - \square = -0.75$

GD PS

9a. Alex and Priya are solving the following algebraic equation.

$21x - 11.5 = -1$



Alex: This equation is impossible as the answer is a whole number.



Priya: x must be 0.5 for this equation to be balanced.

Who is correct? Prove it.

GD R

9b. Oscar and Kelly are solving the following algebraic equation.

$24x - 20.4 = -2.4$



Kelly: This equation is incorrect because 24 is larger than 20.4 so there will not be a negative answer.



Oscar: x must be 0.75 for this equation to be balanced.

Who is correct? Prove it.

GD R

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Reasoning and Problem Solving Two-Step Equations

Developing

1a. Various answers, for example: $x + 3 = 9$; $21 - 2x = 9$; $6x \div 4 = 9$

2a. Various answers, for example: if $y = 4$, then $2y - 1 = 7$; if $y = 5$ then, $2y - 3 = 7$, if $y = 6$, then $2y - 5 = 7$.

3a. Mia is correct because you can take 5 away from both sides, leaving $2x + 1 = 19$; $19 - 1 = 18$ and $18 \div 2 = 9$.

Expected

4a. Various answers, for example: $5x - 5.5 = 7$; $x \div \frac{1}{2} + 2 = 7$; $2x + 2 = 7$

5a. Various answers, for example: if $y = 2$, then $2y + 2 = 6$; if $y = 0.5$, then $2y + 5 = 6$; if $y = 0.25$, then $2y + 5.5 = 6$.

6a. Lily is correct because $0.5 \times 28 = 14$ and $14 - 9 = 5$. James is incorrect because 9 doesn't need to be bigger than the number it is subtracting as it will be multiplied by x first.

Greater Depth

7a. Various answers, for example: $10x - 2.5 = -0.5$; $5x \times 1.5 = 1.5$; $-0.5 + 10x = 1.5$

8a. Various answers, for example: Calculation A: if $y = 3.25$, $14y \div 7 = 6.5$; $12y \div 6 = 6.5$; $10y \div 5 = 6.5$; Calculation B: $2y - 9 = -2.5$; $3y - 12.25 = -2.5$; $4y - 15.5 = -2.5$

9a. Priya is correct because $21 \times 0.5 = 10.5$ and $10.5 - 11.5 = -1$. Alex is incorrect because subtracting a decimal number does not mean you cannot get a whole number for the answer.

Reasoning and Problem Solving Two-Step Equations

Developing

1b. Various answers, for example: $2x + 7 = 21$; $5x - 14 = 21$; $6x \div 2 = 21$

2b. Various answers, for example: if $y = 6$, then $4y + 3 = 27$; if $y = 5$, then $4y + 7 = 27$; if $y = 4$, then $4y + 11 = 27$.

3b. Ben is correct because you can take away 3 from both sides leaving $3x = 16 + 5$; $16 + 5 = 21$. $21 \div 3 = 7$.

Expected

4b. Various answers, for example: $10x - 5.25 = 2.25$; $9x \div 3 = 2.25$; $2x + \frac{3}{4} = 2.25$

5b. Various answers, for example: if $y = 5$, then $3y - 3 = 12$; if $y = 5.5$, then $3y - 4.5 = 12$; if $y = 5.75$, then $3y - 5.25 = 12$.

6b. Bella is correct because $\frac{1}{4} \times 8 = 2$ and $20 \div 2 = 10$. Danny is incorrect because 8 is multiplied by x before dividing 20 by $8x$.

Greater Depth

7b. Various answers, for example: $25x - 8.75 = -2.5$; $-2.5 + 12x = \frac{1}{2}$; $12x \times \frac{1}{2} = 1.5$

8b. Various answers, for example: Calculation A: if $y = 0.5$, $17.5y \div 5 = 1.75$; $14y \div 4 = 1.75$; $10.5y \div 3 = 1.75$; Calculation B: $4y - 2.75 = -0.75$; $7y - 4.25 = -0.75$; $2y - 1.75 = -0.75$

9b. Oscar is correct because $24 \times 0.75 = 18$ and $18 - 20.4 = -2.4$. Kelly is incorrect because the starting number can be made smaller when multiplying by a number less than 1 so there can be a negative answer.

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