

129 Algebra

Solving a two step equation:

$$\textcircled{1} \quad 2x + 5 = 7$$

$$\quad \quad \quad -5 \quad -5$$

$$2x = 2$$

$$\quad \quad \quad 2 \quad \quad 2$$

$$x = 1$$

$$\textcircled{2} \quad \frac{x}{5} - 8 = 3$$

$$\quad \quad \quad +8 \quad +8$$

$$\textcircled{5} \frac{x}{5} = 11 \textcircled{5}$$

$$\quad \quad \quad 5$$

$$x = 55$$

$$\textcircled{3} \quad \frac{2}{3}x + 1 = 7$$

$$\quad \quad \quad -1 \quad -1$$

$$\left(\frac{3}{2}\right) \frac{2}{3}x = 6 \left(\frac{3}{2}\right)$$

$$x = 9$$

$$\textcircled{4} \quad 3(x + 4) = 21$$

$$3x + 12 = 21$$

$$\quad \quad \quad -12 \quad -12$$

$$3x = 9$$

$$\quad \quad \quad 3 \quad \quad 3$$

$$x = 3$$

$$\textcircled{\text{or}} \quad 3(x + 4) = 21$$

$$\quad \quad \quad 3 \quad \quad 3$$

$$x + 4 = 7$$

$$\quad \quad \quad -4 \quad -4$$

$$x = 3$$

$$\textcircled{5} \left(\frac{5}{3}\right) \frac{3}{5}(10x + 5) = 15 \left(\frac{5}{3}\right) \textcircled{\text{or}} \frac{3}{5}(10x + 5) = 15$$

$$10x + 5 = 25$$

$$\quad \quad \quad -5 \quad -5$$

$$\frac{10x}{10} = \frac{20}{10} \quad x = 2$$

$$6x + 3 = 15$$

$$\quad \quad \quad -3 \quad -3$$

$$\frac{6x}{6} = \frac{12}{6} \quad x = 2$$

Simplifying an Expression

Combine Like Terms

$$\textcircled{1} \quad 2x + 8 - 3x - 5 \\ - x + 3$$

$$\textcircled{2} \quad 3x^2 - 2x + 5x - 6x^2 \\ - 3x^2 + 3x$$

$$\textcircled{3} \quad 2(x + 8) + 3x - 7 \\ 2x + 16 + 3x - 7 \\ 5x + 9$$

Factoring: "undistribute" with the GCF

$$\textcircled{1} \quad 3x + 9 \rightarrow 3(x + 3)$$

$$\textcircled{2} \quad 4x + 6 \rightarrow 2(2x + 3)$$

Adding and Subtracting Polynomials

- adding: pretend parentheses aren't there and combine like terms
- subtracting: keep, change, change every term in the second parentheses to its opposite

$$\begin{aligned} & (2x^2 + 3x - 9) - (x^2 + 5x - 6) \\ \rightarrow & (2x^2 + 3x - 9) + (-x^2 + -5x + 6) \\ & \quad \quad \quad x^2 - 2x - 3 \end{aligned}$$

Inequalities

$<$ less than $>$ greater than

\leq less than or equal to

\geq greater than or equal to

*when multiplying by or dividing by
a negative number, reverse the
inequality symbol*

solve inequalities just like solving
an equation

$$\textcircled{1} \quad \frac{3x}{3} \leq \frac{-9}{3}$$
$$x \leq -3$$

$$\textcircled{2} \quad \frac{-3x}{-3} \leq \frac{12}{-3}$$
$$x \geq -4$$

at most 5 $x \leq 5$

at least 5 $x \geq 5$

no more than 5 $x \leq 5$

no less than 5 $x \geq 5$

graphing

$<$, $>$ open circle

\leq , \geq closed circle