

Equation Development 3.1

(KEY)

Algebra 2

Solve, check, and graph the following equations and inequalities.

1) $\frac{d}{-3} + 4 > 2$

$$\frac{-4}{-3} \quad \frac{-4}{-3}$$

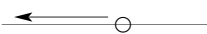
$$(-3)\frac{d}{-3} > -2(-3)$$

$$\boxed{d < 6}$$

$$\checkmark \frac{-18}{-3} + 4 > 2$$

$$6 + 4 > 2$$

$$10 > 2 \checkmark$$



$$0 \quad 6$$

4) $7v^2 - 15 = 13$

$$\frac{+15}{7} \quad \frac{+15}{7}$$

$$\frac{7v^2}{7} = \frac{28}{7}$$

$$\frac{7}{7} \quad \frac{7}{7}$$

$$\sqrt{v^2} = \sqrt{4}$$

$$\boxed{v = \pm 2}$$

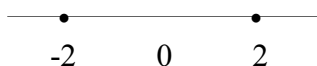
$$\checkmark 7(2)^2 - 15 = 13 \quad 7(-2)^2 - 15 = 13$$

$$7(4) - 15 = 13 \quad 7(4) - 15 = 13$$

$$28 - 15 = 13 \quad 28 - 15 = 13$$

$$13 = 13$$

$$13 = 13 \checkmark$$



$$-2 \quad 0 \quad 2$$

7) $\frac{6}{7}X = \frac{3}{2}$

$$\left(\frac{7}{6}\right)\frac{6}{7}x = \frac{3}{2}\left(\frac{7}{6}\right)$$

$$\boxed{x = \frac{7}{4}}$$

$$\checkmark \frac{6}{7}\left(\frac{7}{4}\right) = \frac{3}{2}$$

$$\frac{3}{2} = \frac{3}{2} \checkmark$$

$$0 \quad 7/4$$

8) $\frac{2}{5}X - 3 = 17$

$$\frac{+3}{5} \quad \frac{+3}{5}$$

$$\frac{2}{5}x = 20$$

$$\left(\frac{5}{2}\right)\left(\frac{2}{5}\right)x = 20\left(\frac{5}{2}\right) \quad \left(-\frac{2}{3}\right)\left(\frac{-3}{2}\right)x = -4\left(\frac{-2}{3}\right)$$

$$\boxed{x = 50}$$

$$0 \quad 50$$

9) $9 - \frac{3}{2}X = 5$

$$\frac{-9}{2} \quad \frac{-9}{2}$$

$$-\frac{3}{2}x = -4$$

$$\boxed{x = \frac{8}{3}}$$

$$0 \quad 8/3$$

3) $-2x + 23 \leq -17 - 10x$

$$\frac{+10x}{8x + 23} \quad \frac{+10x}{8x + 23}$$

$$8x + 23 \leq -17$$

$$\frac{-23}{8} \quad \frac{-23}{8}$$

$$\frac{8x}{8} \leq \frac{-40}{8}$$

$$\boxed{x \leq -5}$$

$$\checkmark -32 > 5(-10) + 4(-10) + 13$$

$$-32 > -50 - 40 + 13$$

$$-32 > -77 \checkmark$$



$$-5 \quad 0$$

5) $26 + 8x = 15x - 37$

$$\frac{-26}{8x} \quad \frac{-26}{8x}$$

$$8x = 15x - 63$$

$$\frac{-15x}{8x} \quad \frac{-15x}{8x}$$

$$\frac{-7x}{8x} = \frac{-63}{8x}$$

$$\frac{-7}{8} \quad \frac{-7}{8}$$

$$\boxed{x = 9}$$

$$\checkmark 26 + 8(9) = 15x - 37$$

$$26 + 72 = 135 - 37$$

$$98 = 98 \checkmark$$



$$0 \quad 9$$

6) $-132 = 4(-9 + 4q)$

$$-132 = -36 + 16q$$

$$\frac{+36}{16} \quad \frac{+36}{16}$$

$$\frac{-96}{16} = \frac{16q}{16}$$

$$\frac{16}{16} \quad \frac{16}{16}$$

$$\boxed{-6 = q}$$

$$\checkmark -132 = 4(-9 + 4(-6))$$

$$-132 = 4(-9 - 24)$$

$$-132 = 4(-33)$$

$$-132 = -132 \checkmark$$



$$-6 \quad 0$$

10) $\frac{9}{5}x + \frac{2}{3}x + 2 = 10$

$$\frac{-2}{15} \quad \frac{-2}{15}$$

$$\frac{27}{15}x + \frac{10}{15}x = 8$$

$$\frac{37}{15}x = 8$$

$$\left(\frac{15}{37}\right)\left(\frac{37}{15}\right)x = 8\left(\frac{15}{37}\right)$$

$$\boxed{x = \frac{120}{37}}$$

$$0 \quad 120/37$$

$$11) |2c - 4| = 12$$

$$\begin{array}{r} 2c - 4 = 12 \quad 2c - 4 = -12 \\ +4 \quad +4 \quad +4 \quad +4 \end{array}$$

$$\frac{2c}{2} = \frac{16}{2} \quad \frac{2c}{2} = \frac{-8}{2}$$

$$c = 8 \quad \text{or} \quad c = -4$$

$$\begin{array}{l} \checkmark |2(8) - 4| = 12 \\ |16 - 4| = 12 \\ |12| = 12 \\ 12 = 12 \end{array} \quad \begin{array}{l} |2(-4) - 4| = 12 \\ |-8 - 4| = 12 \\ |-12| = 12 \\ 12 = 12 \checkmark \end{array}$$



$$12) |t + 8| = -14$$

\emptyset
 No Solution

$$13) |6p - 3| + 15 = 48$$

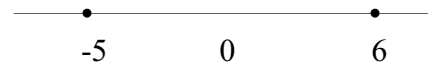
$$\frac{-15}{6p - 3} = \frac{-15}{33}$$

$$6p - 3 = 33 \quad 6p - 3 = -33$$

$$\frac{+3}{6p} = \frac{+3}{36} \quad \frac{+3}{6p} = \frac{-30}{6}$$

$$p = 6 \quad \text{or} \quad p = -5$$

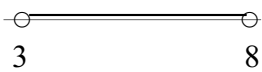
$$\begin{array}{l} \checkmark |6(6) - 3| + 15 = 48 \\ |36 - 3| + 15 = 48 \\ |33| + 15 = 48 \\ 33 + 15 = 48 \\ 48 = 48 \end{array} \quad \begin{array}{l} |6(-5) - 3| + 15 = 48 \\ |-30 - 3| + 15 = 48 \\ |-30| + 15 = 48 \\ 30 + 15 = 48 \\ 48 = 48 \checkmark \end{array}$$



Solve and graph the following compound inequalities.

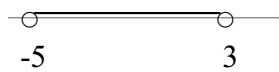
$$14) 3 < x < 8$$

$$x > 3 \quad \text{and} \quad x < 8$$



$$15) \frac{-10 < 2x < 6}{2 \quad 2 \quad 2}$$

$$x > -5 \quad \text{and} \quad x < 3$$



$$16) z < -7 \quad \text{or} \quad z > 4$$



$$17) a > 13 \quad \text{or} \quad a < -1$$



$$18) \frac{-8 < 2k \leq 10}{2 \quad 2 \quad 2}$$

$$k > -4 \quad \text{and} \quad k \leq 5$$



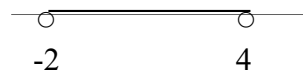
$$19) \frac{5x < -15 \quad \text{or} \quad 3x \geq 12}{5 \quad 5 \quad 3 \quad 3}$$

$$x < -3 \quad \text{or} \quad x \geq 4$$



$$20) \frac{4 < t + 6 < 10}{-6 \quad -6 \quad -6}$$

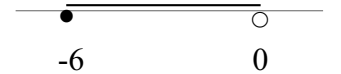
$$t > -2 \quad \text{and} \quad t < 4$$



$$21) \frac{-17 \leq 3t + 1 < 1}{-1 \quad -1 \quad -1}$$

$$\frac{-18 \leq 3t \leq 0}{3 \quad 3 \quad 3}$$

$$t \geq -6 \quad \text{and} \quad t \leq 0$$



Solve the following literal equations.

$$22) -\underline{h} + 5 = k$$

$$\frac{-5}{-\underline{h}} = \frac{-5}{k}$$

$$-\underline{h} = k - 5$$

$$-1 \quad -1$$

$$h = -k + 5$$

$$23) 32 = -\underline{f} + g$$

$$\frac{-g}{32 - g} = \frac{-g}{-f}$$

$$32 - g = -f$$

$$-1 \quad -1$$

$$-32 + g = f$$

$$24) -3\underline{a} - b = 19$$

$$\frac{+b}{-3a} = \frac{+b}{19}$$

$$-3a = b + 19$$

$$-3 \quad -3$$

$$a = -b/3 - 19/3$$

$$25) \frac{-m}{6} + n = 14$$

$$\frac{-n}{-6} = \frac{-n}{-6}$$

$$(-6) \frac{m}{-6} = (-n + 14) (-6)$$

$$m = 6n - 84$$

