

Equations and Inequalities
Algebra 2

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

1) $-78 = -9k - 15$

$$\begin{array}{r} +15 \\ \hline -63 = -9k \\ -9 \end{array}$$

$$7 = k$$

2) $63 = \frac{v}{3} + 39$

$$\begin{array}{r} -39 \\ \hline 24 = \frac{v}{3} \end{array}$$

$$72 = v$$

3) $-81 - 4g^2 = 115$

$$\begin{array}{r} +81 \\ \hline -4g^2 = 196 \\ -4 \end{array}$$

$$g^2 = -49$$

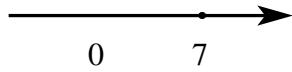
4) $x + 11x = -108$

$$x = -9$$

$$\begin{aligned} \checkmark \quad & -78 = -9(7) - 15 \\ & -78 = -63 - 15 \\ & -78 = -78 \quad \checkmark \end{aligned}$$

$$\sqrt{g^2} = \sqrt{-49}$$

$g = \text{No Real Solution}$



5) $3x + 7 + 3x = -35$

$$6x + 7 = -35$$

$$\begin{array}{r} -7 \\ \hline -7 \end{array}$$

$$\begin{array}{r} 6x = -42 \\ 6 \quad 6 \\ x = -7 \end{array}$$

$$\begin{aligned} \checkmark \quad & 3(-7) + 7 + 3(-7) = -35 \\ & -21 + 7 - 21 = -35 \\ & -35 = -35 \quad \checkmark \end{aligned}$$

6) $7x + 19 - 6x = 15$

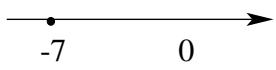
$$x = -4$$

$$\begin{array}{r} -3x \\ \hline -3x \end{array}$$

$$d = -4$$

$$\begin{array}{r} 3x = 21 \\ 3 \quad 3 \\ x = 7 \end{array}$$

$$\begin{aligned} \checkmark \quad & 6(7) = 3(7) + 21 \\ & 42 = 21 + 21 \\ & 42 = 42 \quad \checkmark \end{aligned}$$



9) $11 + 5a = 3a + 41$

$$\begin{array}{r} -3a \\ \hline -3a \end{array}$$

$$\begin{array}{r} 11 + 2a = 41 \\ -11 \\ \hline 2a = 30 \end{array}$$

$$\begin{array}{r} 2 \\ 2 \end{array}$$

$$a = 15$$

10) $-2x + 23 = -17 - 10x$

$$x = -5$$

11) $\frac{2(2x + 6)}{2} = \frac{20}{2}$

$$\begin{array}{r} (2x + 6) = 10 \\ -6 \quad -6 \\ \hline 2x = 4 \end{array}$$

$$x = 2$$

$$12) \quad 102 = 6(3n + 2)$$

$$n = 5$$

$$13) \quad 3(5v + 8) = 16v + 22$$

$$\begin{array}{rcl} 15v + 24 & = & 16v + 22 \\ -15v & & -15v \\ \hline 24 & = & v + 22 \\ -22 & & -22 \\ \hline \end{array}$$

$$14) \quad a + 12 > 21$$

$$a > 9$$

$$15) \quad b - 15 < 8$$

$$\begin{array}{rcl} & & +15 \\ & & \hline b & < & 23 \end{array}$$

$$\checkmark (20)-15<8$$

$$2 = v$$

$$\checkmark 3(5(2)+8) = 16(2) + 22$$

$$3(10+8) = 32+22$$

$$3(18) = 54$$

$$54 = 54 \checkmark$$

$$5 < 8 \checkmark$$



$$0 \qquad 23$$

$$16) \quad -3x + 7 < -17$$

$$x > 8$$

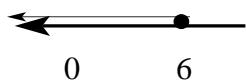
$$17) \quad -14x + 5x \geq -54$$

$$\frac{-9x}{-9} \geq \frac{-54}{-9}$$

$$x \leq 6$$

$$\checkmark -14(0) + 5(0) \geq -54$$

$$0 \geq -54$$



$$18) \quad 2x - 24 \geq 8x$$

$$-4 \geq x$$

$$19) \quad -2x + 23 \leq -17 - 10x$$

$$\frac{+10x}{+10x}$$

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

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

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

$$x \leq -5$$

