

Solve each equation.

30) $2x - 37 = 7x - 3(1 - 4x)$

$$2x - 37 = 7x - 3 + 12x$$

$$2x - 37 = 19x - 3$$

$$-34 = 17x$$

$$\boxed{-2 = x}$$

31) $8(n - 6) + 8 = 8n - 43$

$$8n - 48 + 8 = 8n - 43$$

$$\begin{array}{r} 8n + 40 = 8n - 43 \\ -8n \quad -8n \end{array}$$

$$40 = -43$$

$$\boxed{\text{NO SOLUTION}}$$

32) $-6(3 - r) = -18 + 6r$

$$\begin{array}{r} -18 + 6r = -18 + 6r \\ -6r \quad -6r \end{array}$$

$$-18 = -18$$

$\boxed{\text{INFINITE SOLUTIONS}}$

33) $2(-1 - 8x) + 3x = -3x - 2$

$$-2 - 16x + 3x = -3x - 2$$

$$\begin{array}{r} -2 - 13x = -3x - 2 \\ +13x \quad +13x \end{array}$$

$$\begin{array}{r} -2 = 10x - 2 \\ +2 \quad +2 \end{array}$$

$$\begin{array}{r} 0 = 10x \\ 10 \quad 10 \end{array}$$

$$\boxed{0 = x}$$

Solve each equation by taking square roots.

34) $5 - 8x^2 = -507$

$$-8x^2 = -512$$

$$x^2 = 64$$

$$x = \pm\sqrt{64}$$

$$\boxed{x = \pm 8}$$

35) $4n^2 + 3 = 151$

$$4n^2 = 148$$

$$n^2 = 37$$

$$\boxed{n = \pm\sqrt{37}}$$

Solve each equation by factoring.

36) $n^2 - 3n - 14 = 0$

$$n^2 - 3n - 10 = 0$$

$\begin{matrix} \oplus & \otimes \\ -3 & -10 \end{matrix}$

$$(n - 5)(n + 2) = 0$$

$$\begin{array}{l} \downarrow \\ n - 5 = 0 \\ \boxed{n = 5} \end{array}$$

$$\begin{array}{l} \downarrow \\ n + 2 = 0 \\ \boxed{n = -2} \end{array}$$

37) $r^2 + 7r + 6 = 0$

$\begin{matrix} \oplus & \otimes \\ 7 & 6 \end{matrix}$

$$(r + 1)(r + 6) = 0$$

$$\begin{array}{l} \downarrow \\ r + 1 = 0 \\ \boxed{r = -1} \end{array}$$

$$\begin{array}{l} \downarrow \\ r + 6 = 0 \\ \boxed{r = -6} \end{array}$$

$$38) n^2 - n - 56 = 0 \quad \begin{matrix} (+) \\ -1 \end{matrix} \quad \begin{matrix} (*) \\ -56 \end{matrix}$$

$$(n-8)(n+7) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ n-8=0 & n+7=0 \\ \boxed{n=8} & \boxed{n=-7} \end{matrix}$$

$$39) x^2 - 4x - 22 = -2 - 5x$$

$$\begin{matrix} +5x & +2 & +2 & +5x \end{matrix}$$

$$x^2 + x - 20 = 0 \quad \begin{matrix} (+) \\ 1 \end{matrix} \quad \begin{matrix} (*) \\ -20 \end{matrix}$$

$$(x+5)(x-4) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ x+5=0 & x-4=0 \\ \boxed{x=-5} & \boxed{x=4} \end{matrix}$$

$$40) 25a^2 - 4 = 0 \quad \begin{matrix} (+) \\ 0 \end{matrix} \quad \begin{matrix} (*) \\ -100 \end{matrix}$$

$$\star 25a^2 + 0a - 4 = 0$$

$$(25a^2 + 10a) + (10a - 4) = 0$$

$$5a(5a+2) + -2(5a+2) = 0$$

$$(5a-2)(5a+2) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ 5a-2=0 & 5a+2=0 \\ 5a=2 & 5a=-2 \\ \boxed{a=2/5} & \boxed{a=-2/5} \end{matrix}$$

$$41) 6v^2 + 11v + 3 = 0 \quad \begin{matrix} (+) \\ 11 \end{matrix} \quad \begin{matrix} (*) \\ 18 \end{matrix}$$

$$(6v^2 + 9v) + (2v + 3) = 0$$

$$3v(2v+3) + 1(2v+3) = 0$$

$$(3v+1)(2v+3) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ 3v+1=0 & 2v+3=0 \\ 3v=-1 & 2v=-3 \\ \boxed{v=-1/3} & \boxed{v=-3/2} \end{matrix}$$

$$42) 7a^2 - 25a + 18 = 0$$

$$\begin{matrix} +6 & -12 \\ -25 & 84 \end{matrix}$$

$$(7a^2 - 4a) + (-21a + 18) = 0$$

$$a(7a-4) + -3(7a-4) = 0$$

$$(a-3)(7a-4) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ a-3=0 & 7a-4=0 \\ \boxed{a=3} & 7a=4 \\ & \boxed{a=4/7} \end{matrix}$$

$$43) 7m^2 + 6m = 0 \quad \begin{matrix} (+) \\ 6 \end{matrix} \quad \begin{matrix} (*) \\ 0 \end{matrix}$$

$$\star 7m^2 + 6m + 0 = 0$$

$$(7m^2 + 6m) + (0m + 0) = 0$$

$$m(7m+6) = 0$$

$$\begin{matrix} \downarrow & \downarrow \\ \boxed{m=0} & 7m+6=0 \\ & 7m=-6 \\ & \boxed{m=-6/7} \end{matrix}$$

Solve each equation with the quadratic formula.

44) $3m^2 - 5m - 102 = 10$

$3m^2 - 5m - 112 = 0$

$a: 3 \quad b: -5 \quad c: -112$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - (4 \cdot 3 \cdot -112)}}{2 \cdot 3}$$

$$x = \frac{5 \pm \sqrt{25 - 1344}}{6}$$

$$x = \frac{5 \pm \sqrt{1369}}{6}$$

$$x = \frac{5 \pm 37}{6}$$

① $x = \frac{5+37}{6}$

$$x = \frac{42}{6}$$

$$x = \boxed{7}$$

② $x = \frac{5-37}{6}$

$$x = \frac{-32}{6}$$

$$x = \boxed{-5.\bar{3}}$$

45) $9r^2 - 12r = 2r^2 - 12r + 14$

$7r^2 + 0r - 14 = 0$

$a: 7 \quad b: 0 \quad c: -14$

$$x = \frac{-0 \pm \sqrt{0^2 - (4 \cdot 7 \cdot -14)}}{2 \cdot 7}$$

$$x = \frac{0 \pm \sqrt{0 - -392}}{14}$$

$$x = \frac{0 \pm \sqrt{392}}{14}$$

$$x = \frac{0 \pm \sqrt{196 \cdot 2}}{14}$$

$$x = \frac{\pm 14\sqrt{2}}{14} = \frac{\pm \sqrt{2}}{1} = \boxed{\pm\sqrt{2}}$$

Solve each equation.

46) $|3x - 6| = 12$

① $3x - 6 = 12$

$$3x = 18$$

$$x = \boxed{6}$$

② $3x - 6 = -12$

$$3x = -6$$

$$x = \boxed{-2}$$

47) $|-7 - 2p| + 6 = 21$

$$|-7 - 2p| = 15$$

① $-7 - 2p = 15$

$$-2p = 22$$

$$p = \boxed{-11}$$

② $-7 - 2p = -15$

$$-2p = -8$$

$$p = \boxed{4}$$

$$48) \frac{1}{-2} + 8|3 - 9x| = 26$$

$$\frac{1}{8}|3 - 9x| = \frac{24}{8}$$

$$|3 - 9x| = 3$$

$$\textcircled{1} \begin{aligned} 3 - 9x &= 3 \\ -9x &= 0 \\ \boxed{x = 0} \end{aligned}$$

$$\textcircled{2} \begin{aligned} 3 - 9x &= -3 \\ -9x &= -6 \\ \boxed{x = \frac{6}{9} = \frac{2}{3}} \end{aligned}$$

Solve each inequality and graph its solution.

$$49) -15 + x < 3(7x - 5)$$



$$-15 + x < 3(7x - 5)$$

$$\begin{array}{r} -15 + x < 21x - 15 \\ +15 \quad \quad \quad +15 \end{array}$$

$$\begin{array}{r} x < 21x \\ -x \quad \quad \quad -x \end{array}$$

$$\frac{0}{20} < \frac{20x}{20}$$

$$\boxed{0 < x}$$

$$50) 2(8 - 4b) \leq 16 - 8b$$



$$2(8 - 4b) \leq 16 - 8b$$

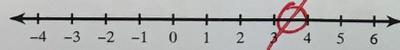
$$\begin{array}{r} 16 - 8b \leq 16 - 8b \\ -16 \quad \quad \quad -16 \end{array}$$

$$\begin{array}{r} -8b \leq -8b \\ +8b \quad \quad \quad +8b \end{array}$$

$$\boxed{0 \leq 0} \quad \text{TRUE}$$

INFINITE SOLUTIONS

$$51) 4(x - 7) > -28 + 4x$$



$$4(x - 7) > -28 + 4x$$

$$\begin{array}{r} 4x - 28 > -28 + 4x \\ -4x \quad \quad \quad -4x \end{array}$$

$$-8 > -28 \quad \text{FALSE}$$

NO SOLUTIONS

$$52) -5 + 5x \geq 2(-2 + 5x) - 4x$$



$$-5 + 5x \geq 2(-2 + 5x) - 4x$$

$$-5 + 5x \geq -4 + 10x - 4x$$

$$\begin{array}{r} -5 + 5x \geq -4 + 6x \\ -5x \quad \quad \quad -5x \end{array}$$

$$\begin{array}{r} -5 \geq -4 + x \\ +4 \quad \quad \quad +4 \end{array}$$

$$\boxed{-1 \geq x}$$

Solve each compound inequality and graph its solution.

53) $-61 < 3 + 8b \leq 27$

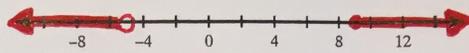


$$\begin{array}{r} -61 < 3 + 8b \leq 27 \\ -3 \quad -3 \end{array}$$

$$\frac{-64}{8} < \frac{8b}{8} \leq \frac{24}{8}$$

$$\boxed{-8 < b \leq 3}$$

54) $6n - 7 \geq 47$ or $10 - 8n > 50$



$$6n - 7 \geq 47$$

$$6n \geq 54$$

$$\boxed{n \geq 9} \quad \text{OR}$$

$$10 - 8n > 50$$

$$-8n > 40$$

$$\boxed{n < -5}$$

Solve each inequality.

55) $|-3n + 5| > 4$

① $-3n + 5 > 4$

$$-3n > -1$$

$$\boxed{n < \frac{1}{3}}$$

② $-3n + 5 < -4$

$$-3n < -9$$

$$\boxed{n > 3}$$

56) $4|3x - 9| \geq 84$

$$|3x - 9| \geq 21$$

① $3x - 9 \geq 21$

$$3x \geq 30$$

$$\boxed{x \geq 10}$$

② $3x - 9 \leq -21$

$$3x \leq -12$$

$$\boxed{x \leq -4}$$

57) $-2|6 - 6n| + 4 \leq -20$

$$\frac{-2|6 - 6n| \leq -24}{-2}$$

$$|6 - 6n| \geq 12$$

① $6 - 6n \geq 12$

$$-6n \geq 6$$

$$\boxed{n \leq -1}$$

② $6 - 6n \leq -12$

$$-6n \leq -18$$

$$\boxed{n \geq 3}$$