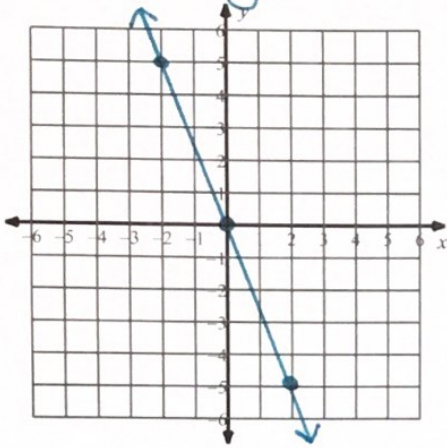


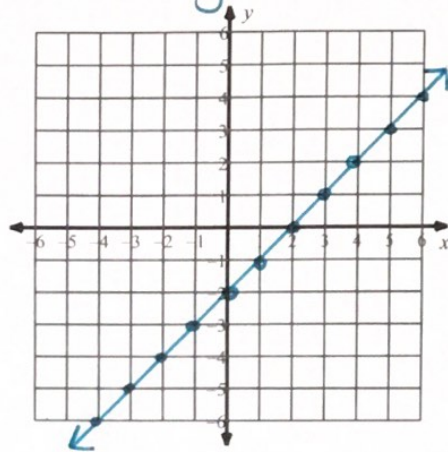
Chapter 1 Review

Sketch the graph of each line.

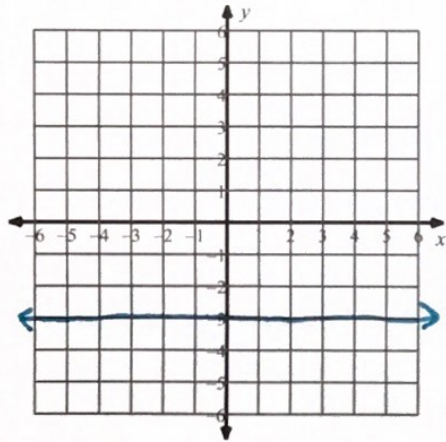
1) $5x + 2y = 0$ $y = -\frac{5}{2}x$



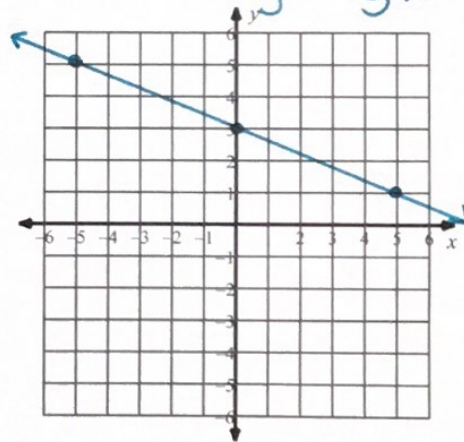
2) $x - y = 2$ $y = x - 2$



3) $y = -3$

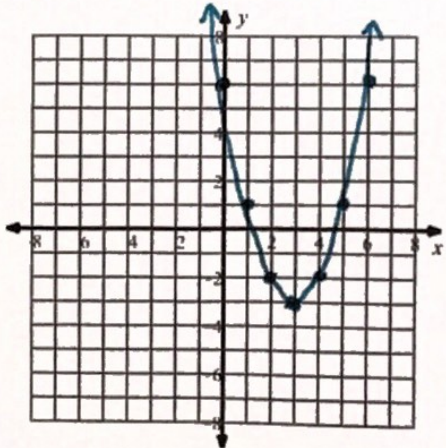


4) $2x + 5y = 15$ $y = -\frac{2}{5}x + 3$

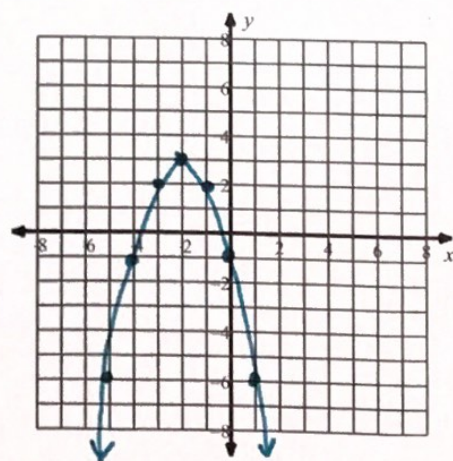


Graph each equation.

5) $y = x^2 - 6x + 6$



6) $y = -x^2 - 4x - 1$



Determine if the equation is symmetrical to the x-axis, y-axis, origin, or none.

7) $y = x^2 + 4$

y-axis

8) $x = -y^2 + 4$

x-axis

9) $y = 2x - 10$

none

10) $y = -x^3 - x$

origin

Solve each equation.

11) $-6m + 3 - 6m = -21$

$$-12m + 3 = -21$$

$$-12m = -24$$

$$m = 2$$

12) $-7 = -3v + 4v$

$$-7 = v$$

13) $-6 - 2n = -8 - 2(n+1)$

$$-6 - 2n = -8 - 2n - 2$$

$$-6 - 2n = -10 - 2n$$

$$-6 = -10$$

No solution

14) $30 + 5a = 6(5a - 8) + a$

$$30 + 5a = 30a - 48 + a$$

$$30 + 5a = 31a - 48$$

$$-26a = -78$$

$$a = 3$$

15) $\left(\frac{3}{2}a + \frac{5}{3} + 2 = \frac{13}{6}\right) \cdot \frac{6}{1}$

$$9a + 10 + 12 = 13$$

$$9a + 22 = 13$$

$$9a = -9$$

$$a = -1$$

16) $\left(2x - \frac{5}{3} - 2 = \frac{17}{15}\right) \cdot \frac{15}{1}$

$$30x - 25 - 30 = 17$$

$$30x - 55 = 17$$

$$30x = 72$$

$$x = \frac{12}{5}$$

Solve each equation. Remember to check for extraneous solutions.

$$17) \left(\frac{2}{r^2} = \frac{1}{6r^2} - \frac{1}{6r} \right) \cdot \frac{6r^2}{1}$$

$$12 = 1 - r$$

$$11 = -r$$

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

$$18) \left(\frac{x+1}{3x} + \frac{1}{x} = 1 \right) \cdot \frac{3x}{1}$$

$$x+1+3=3x$$

$$x+4=3x$$

$$4=2x$$

$$\boxed{x=2}$$

$$19) \frac{1}{n^2-4n-5} = \frac{5}{n^2-4n-5} + \frac{1}{n+1}$$

$$\left(\frac{1}{(n-5)(n+1)} = \frac{5}{(n-5)(n+1)} + \frac{1}{n+1} \right) \cdot \frac{(n-5)(n+1)}{1}$$

$$1 = 5 + n - 5$$

$$\boxed{1 = n}$$

$$20) \frac{k+6}{3k^2-18k} = \frac{1}{k} - \frac{4}{3k^2-18k}$$

$$\left(\frac{k+6}{3k(k-6)} = \frac{1}{k} - \frac{4}{3k(k-6)} \right) \cdot \frac{3k(k-6)}{1}$$

$$k+6 = 3(k-6) - 4$$

$$k+6 = 3k - 18 - 4$$

$$k+6 = 3k - 22$$

$$-2k = -28$$

$$\boxed{k=14}$$

Factor each.

$$21) f(x) = x^2 - 6x + 8$$

$$\begin{array}{r} -2 \times 8 \\ -6 \times -4 \end{array}$$

$$\boxed{f(x) = (x-2)(x-4)}$$

$$22) f(x) = x^2 + 2x - 15$$

$$\begin{array}{r} -15 \\ 5 \times -3 \\ 2 \end{array}$$

$$\boxed{f(x) = (x+5)(x-3)}$$

$$23) f(x) = 5x^2 + 9x - 2$$

$$\begin{array}{r} -10 \\ 10 \times -1 \\ 9 \end{array}$$

$$f(x) = (5x^2 + 10x)(x-2)$$

$$f(x) = 5x(x+2) - 1(x+2)$$

$$\boxed{f(x) = (x+2)(5x-1)}$$

$$24) f(x) = 2x^2 - 5x + 2$$

$$\begin{array}{r} 4 \\ -1 \times -4 \\ 5 \end{array}$$

$$f(x) = (2x^2 - 4x)(x+2)$$

$$f(x) = x(2x-1) - 2(2x-1)$$

$$\boxed{f(x) = (2x-1)(x-2)}$$

$$25) f(x) = (x^3 + 2x^2 + 4x + 8)$$

$$f(x) = x^2(x+2) + 4(x+2)$$

$$f(x) = (x+2)(x^2+4)$$

$$26) f(x) = (4x^3 - x^2 - 4x + 1)$$

$$f(x) = x^2(4x-1) - 1(4x-1)$$

$$f(x) = (4x-1)(x^2-1)$$

$$f(x) = (4x-1)(x+1)(x-1)$$

Solve each equation by factoring.

$$27) n^2 + 3n = 0$$

$$n(n+3) = 0$$

$$n = 0 \quad n+3 = 0$$

$$n = 0, -3$$

$$28) n^2 - 9n + 20 = 0$$

$$\begin{array}{r} 20 \\ -4 \times -5 \\ -9 \end{array}$$

$$(n-4)(n-5) = 0$$

$$n-4 = 0 \quad n-5 = 0$$

$$n = 4, 5$$

$$29) 4x^2 - 24x + 8 = 8$$

$$4x^2 - 24x = 0$$

$$4x(x-6) = 0$$

$$4x = 0 \quad x-6 = 0$$

$$x = 0, 6$$

$$30) n^2 + 10n + 19 = -5$$

$$n^2 + 10n + 24 = 0$$

$$(n+4)(n+6) = 0$$

$$n+4 = 0 \quad n+6 = 0$$

$$n = -4, -6$$

$$31) 3v^2 - 18 = -15v$$

$$3v^2 + 15v - 18 = 0$$

$$3(v^2 + 5v - 6) = 0$$

$$3(v-1)(v+6) = 0$$

$$v-1 = 0 \quad v+6 = 0$$

$$v = 1, -6$$

$$32) n^2 = -6 - 5n$$

$$n^2 + 5n + 6 = 0$$

$$(n+2)(n+3) = 0$$

$$n+2 = 0 \quad n+3 = 0$$

$$n = -2, -3$$

Solve each equation by completing the square.

$$33) b^2 + 12b - 58 = 0$$

$$\left(\frac{12}{2}\right)^2 = 6^2 = 36$$

$$b^2 + 12b + 36 = 58 + 36$$

$$(b+6)^2 = 94$$

$$\boxed{b = -6 \pm \sqrt{94}}$$

$$35) 3r^2 + 18r + 14 = 2$$

$$3(r^2 + 6r) = 2 - 14$$

$$3(r^2 + 6r + 9) = 2 - 14 + 27$$

$$3(r+3)^2 = 15$$

$$\boxed{r = -3 \pm \sqrt{5}}$$

$$34) m^2 + 18m + 100 = 8$$

$$\left(\frac{18}{2}\right)^2 = 9^2 = 81$$

$$m^2 + 18m + 81 = 8 - 100 + 81$$

$$(m+9)^2 = -11$$

$$\boxed{m = -9 \pm i\sqrt{11}}$$

$$36) 4x^2 - 8x + 25 = -6$$

$$4(x^2 - 2x) = -6 - 25$$

$$4(x^2 - 2x + 1) = -6 - 25 + 4$$

$$4(x-1)^2 = -27$$

$$\boxed{x = 1 \pm \frac{3i\sqrt{3}}{2}}$$

Solve each equation with the quadratic formula.

$$37) 7n^2 - 10n - 1 = 0$$

$$\frac{10 \pm \sqrt{(-10)^2 - 4(7)(-1)}}{2(7)}$$

$$\boxed{n = \frac{5 \pm 4\sqrt{2}}{7}}$$

$$39) r^2 + 7 = 0$$

$$\frac{0 \pm \sqrt{0^2 - 4(1)(7)}}{2(1)}$$

$$\boxed{r = \pm i\sqrt{7}}$$

$$38) 9n^2 - 2n + 13 = 2$$

$$9n^2 - 2n + 11 = 0$$

$$\frac{2 \pm \sqrt{(-2)^2 - 4(9)(11)}}{2(9)}$$

$$\boxed{n = \frac{1 \pm 7i\sqrt{2}}{9}}$$

$$40) 3n^2 - 3n = -1$$

$$3n^2 - 3n + 1 = 0$$

$$\frac{3 \pm \sqrt{(-3)^2 - 4(3)(1)}}{2(3)}$$

$$\boxed{n = \frac{3 \pm i\sqrt{3}}{6}}$$

Find the discriminant of each quadratic equation then state the number and type of solutions.

$$41) -3k^2 + 7k + 6 = 0$$

$$7^2 - 4(-3)(6)$$

$$\boxed{121}$$

Two solutions

$$42) 10x^2 + 10x - 2 = -7$$

$$10x^2 + 10x + 5 = 0$$

$$10^2 - 4(10)(5)$$

$$\boxed{-100}$$

$$43) 5x^2 + 5 = -10x$$

$$5x^2 + 10x + 5 = 0$$

$$10^2 - 4(5)(5)$$

0

one solution

Simplify.

$$45) i^{101}$$

$$i \text{ OR } \sqrt{-1}$$

$$44) 5n^2 = -5n$$

$$5n^2 + 5n = 0$$

$$5^2 - 4(5)(0)$$

25

two solutions

$$46) i^{255}$$

$$-i \text{ OR } -\sqrt{-1}$$

$$47) i^{18}$$

$$-1$$

$$48) i^{600}$$

$$1$$

$$49) 2 - (8 - i) + (6 - 4i)$$

$$2 - 8 + i + 6 - 4i$$

$$-3i$$

$$50) (-1 + 3i) - (5 - 3i) + 8$$

$$-1 + 3i - 5 + 3i + 8$$

$$2 + 6i$$

$$51) (-6i) - (5 - 5i) + (8 - 6i)$$

$$-6i - 5 + 5i + 8 - 6i$$

$$3 - 7i$$

$$52) (8 + 8i) - (-7 - i) + (-8 + 5i)$$

$$8 + 8i + 7 + i - 8 + 5i$$

$$7 + 14i$$

$$53) (3 + 6i)(-7 - 6i)$$

$$-21 - 18i - 42i - 36i^2$$

$$-21 - 60i + 36$$

$$15 - 60i$$

$$54) (-5 + 2i)(8 - 2i)$$

$$-40 + 10i + 16i - 4i^2$$

$$-40 + 26i + 4$$

$$-36 + 26i$$

$$55) (-7 - 8i)^2$$

$$(-7 - 8i)(-7 - 8i)$$

$$49 + 56i + 56i + 64i^2$$

$$49 + 112i - 64$$

$$\boxed{-15 + 112i}$$

$$57) \frac{(4 - 9i)(-8 - i)}{(-8 + i)(-8 - i)}$$

$$\frac{-32 - 4i + 72i + 9i^2}{64 + 8i - 8i - i^2}$$

$$\frac{-32 - 4i + 72i + 9i^2}{64 + 8i - 8i - i^2}$$

$$\boxed{\frac{-41 + 68i}{65}}$$

$$59) \frac{(10 + 10i)(8 + 4i)}{(8 - 4i)(8 + 4i)}$$

$$\frac{80 + 40i + 80i + 40i^2}{64 + 32i - 32i - 16i^2}$$

$$\frac{40 + 120i}{80} = \boxed{\frac{1 + 3i}{2}}$$

$$56) (5 + 4i)^2$$

$$(5 + 4i)(5 + 4i)$$

$$25 + 20i + 20i + 16i^2$$

$$25 + 40i - 16$$

$$\boxed{9 + 40i}$$

$$58) \frac{6i(1 + 10i)}{(1 - 10i)(1 + 10i)}$$

$$\frac{6i + 60i^2}{1 + 10i - 10i - 100i^2}$$

$$\boxed{\frac{-60 + 6i}{101}}$$

$$60) \frac{(4 + 4i)(2 - 8i)}{(2 + 8i)(2 - 8i)}$$

$$\frac{8 - 32i + 8i - 32i^2}{4 - 16i + 16i - 64i^2}$$

$$\frac{40 - 24i}{68} = \boxed{\frac{10 - 6i}{17}}$$

Solve each equation. Remember to check for extraneous solutions.

$$61) \sqrt{1 - 8n} = 7^2$$

$$1 - 8n = 49$$

$$-8n = 48$$

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

$$62) (\sqrt{2x + 3})^2 = (x + 2)^2$$

$$2x + 3 = x^2 + 4x + 4$$

$$x^2 + 2x + 1 = 0$$

$$(x + 1)(x + 1) = 0$$

$$x + 1 = 0 \rightarrow \boxed{x = -1}$$

$$63) (1 + \sqrt{5 - x})^2 = (\sqrt{6 - x})^2$$

$$1 + 2\sqrt{5 - x} + 5 - x = 6 - x$$

$$2\sqrt{5 - x} = 0$$

$$\sqrt{5 - x} = 0^2$$

$$5 - x = 0$$

$$\boxed{x = 5}$$

$$64) 1 = \sqrt{3 - 3x} - \sqrt{2x + 8}$$

$$(1 + \sqrt{2x + 8})^2 = (\sqrt{3 - 3x})^2$$

$$1 + 2\sqrt{2x + 8} + 2x + 8 = 3 - 3x$$

$$(2\sqrt{2x + 8})^2 = (6 - 5x)^2$$

$$4(2x + 8) = 36 + 60x + 25x^2$$

$$8x + 32 = 36 + 60x + 25x^2 \rightarrow \boxed{x = -2, \frac{2}{25}}$$

Solve each equation.

$$65) (512)^{2/3} = (b^2)^{2/3}$$

$$512^{2/3} = b$$

$$(\sqrt[3]{512})^2 = b$$

$$\boxed{64 = b}$$

$$66) 5^2 = (x-22)^{1/2}$$

$$25 = x-22$$

$$\boxed{x = 47}$$

$$67) 502 = (3v-11)^{3/2} - 10$$

$$512^{2/3} = (3v-11)^{3/2}$$

$$(\sqrt[3]{512})^2 = 3v-11$$

$$64 = 3v-11$$

$$\boxed{v = 25}$$

$$68) 57 = 2(-15-a)^{3/2} + 3$$

$$54 = 2(-15-a)^{3/2}$$

$$27^{2/3} = (-15-a)^{3/2}$$

$$(\sqrt[3]{27})^2 = -15-a$$

$$9 = -15-a \rightarrow \boxed{a = -24}$$

$$69) \left| \frac{n}{6} \right| = 2$$

$$\frac{n}{6} = 2 \quad -\frac{n}{6} = 2$$

$$\boxed{n = 12, -12}$$

$$70) |n-9| = 19$$

$$n-9 = 19 \quad -n+9 = 19$$

$$n = 28 \quad -n = 10$$

$$\boxed{n = 28, -10}$$

$$71) |-2p| - 4 = 10$$

$$|-2p| = 14$$

$$-2p = 14 \quad 2p = 14$$

$$\boxed{p = -7, 7}$$

$$72) -5 + |n+8| = -3$$

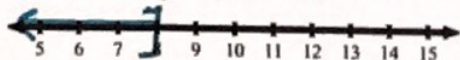
$$|n+8| = 2$$

$$n+8 = 2 \quad -n-8 = 2$$

$$\boxed{n = -6, -10}$$

Solve each inequality and graph its solution.

$$73) -(1+2n) - 8n \geq -81$$



$$-1-2n-8n \geq -81$$

$$-1-10n \geq -81$$

$$-10n \geq -80$$

$$\boxed{n \leq 8} \quad \boxed{(-\infty, 8]}$$

$$74) -186 \leq -6(6-5p)$$

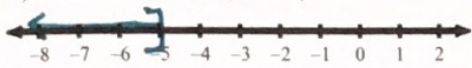


$$-186 \leq -36 + 30p$$

$$-150 \leq 30p$$

$$\boxed{-5 \leq p} \quad \boxed{[-5, \infty)}$$

$$75) -27 - 7x \geq 8(x+6)$$

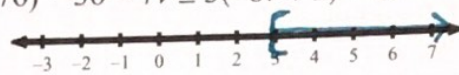


$$-27 - 7x \geq 8x + 48$$

$$-75 \geq 15x$$

$$\boxed{-5 \geq x} \quad \boxed{(-\infty, -5]}$$

$$76) -36 - 7v \geq 3(-8v+3) + 2v$$



$$-36 - 7v \geq -24v + 9 + 2v$$

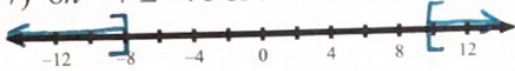
$$-36 - 7v \geq -22v + 9$$

$$15v \geq 45$$

$$\boxed{v \geq 3} \quad \boxed{[3, \infty)}$$

Solve each compound inequality and graph its solution.

$$77) 8n - 7 \leq -71 \text{ or } 9 + 6n \geq 69$$



$$8n \leq -64 \text{ OR } 6n \geq 60$$

$$\boxed{n \leq -8 \text{ OR } n \geq 10}$$

$$\boxed{(-\infty, -8] \cup [10, \infty)}$$

$$78) 4 + 9m > -41 \text{ or } 7m - 6 \leq -55$$



$$9m > -45 \text{ OR } 7m \leq -49$$

$$\boxed{m > -5 \text{ OR } m \leq -7}$$

$$\boxed{(-\infty, -7] \cup (-5, \infty)}$$

$$79) -40 \leq 5 + 5v \leq -5$$



$$-45 \leq 5v \leq -10$$

$$\boxed{-9 \leq v \leq -2}$$

$$\boxed{[-9, -2]}$$

$$80) -69 < -9n + 3 \leq -51$$



$$-72 < -9n \leq -54$$

$$\boxed{8 > n \geq 6}$$

$$\boxed{[6, 8)}$$

Solve each inequality and graph its solution.

$$81) |n+1| \leq 5$$

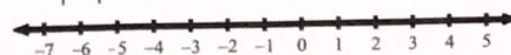


$$-5 \leq n+1 \leq 5$$

$$\boxed{-6 \leq n \leq 4}$$

$$\boxed{[-6, 4]}$$

$$82) \left| \frac{b}{6} \right| \leq -4$$



$\boxed{\text{No solution}}$

$$83) -7 + \left| \frac{a}{6} \right| > -6$$



$$\left| \frac{a}{6} \right| > 1$$

$$\frac{a}{6} > 1 \text{ OR } \frac{a}{6} < -1$$

$$a > 6 \text{ OR } a < -6$$

$$(-\infty, -6) \cup (6, \infty)$$

Solve and write your answer in interval notation.

$$85) n^2 + n - 42 > 0$$

$$\begin{array}{r} 42 \\ 7 \times -6 \\ 1 \end{array} (n+7)(n-6) = 0$$

$$n = -7, 6$$



$$(-\infty, -7) \cup (6, \infty)$$

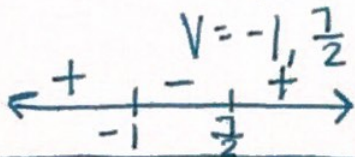
$$87) 2v^2 - 5v - 7 \geq 0$$

$$\begin{array}{r} 14 \\ -7 \times 2 \\ -5 \end{array} 2v^2 - 7v + 2v - 7 = 0$$

$$v(2v-7) + 1(2v-7) = 0$$

$$(v+1)(2v-7) = 0$$

$$v = -1, \frac{7}{2}$$

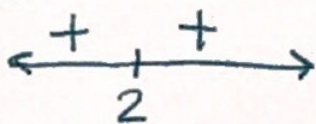


$$(-\infty, -1] \cup [\frac{7}{2}, \infty)$$

$$89) n^2 - 4n + 4 < 0$$

$$\begin{array}{r} 4 \\ -2 \times -2 \\ -4 \end{array} (n-2)(n-2) = 0$$

$$n = 2$$



No solution

$$84) \left| \frac{p}{7} \right| - 2 \geq -3$$



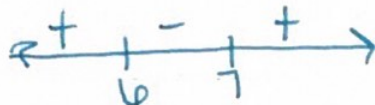
$$\left| \frac{p}{7} \right| \geq -1$$

All real numbers

$$86) r^2 - 13r + 42 \leq 0$$

$$\begin{array}{r} 42 \\ -6 \times -7 \\ +42 \end{array} (r-6)(r-7) = 0$$

$$r = 6, 7$$



$$[6, 7]$$

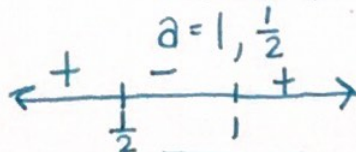
$$88) 2a^2 - 3a + 1 < 0$$

$$\begin{array}{r} 2 \\ -1 \times -2 \\ -3 \end{array} 2a^2 - 2a - 2a + 1 = 0$$

$$a(2a-1) - 1(2a-1) = 0$$

$$(a-1)(2a-1) = 0$$

$$a = 1, \frac{1}{2}$$

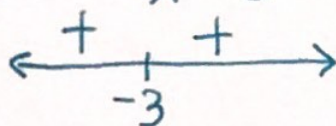


$$\left(\frac{1}{2}, 1 \right)$$

$$90) x^2 + 6x + 9 \leq 0$$

$$\begin{array}{r} 9 \\ 3 \times 3 \\ 6 \end{array} (x+3)(x+3) = 0$$

$$x = -3$$



$$\{-3\}$$