

Math 032037 step

6-30-18 40
Don't
Don't
don't
don't

①

$$2x - 6 < 7x + 4$$

$$2x - \cancel{6} + \cancel{6} < 7x + 4 + 6$$

$$2x < 7x + 10$$

$$2x - 7x < 7x + 10 - 7x$$

$$-5x < 10$$

$$\frac{-5x}{-5} > \frac{10}{-5}$$

divide by a negative
and turn the alligator
around

$$x > -2$$



-2

$$(-2, \infty)$$

$$(2) \quad h(x) = 2x^2 - 4$$

$$h(-1) = 2(-1)^2 - 4$$

$$h(-1) = 2(-1)(-1) - 4$$

$$h(-1) = 2(1) - 4$$

$$h(-1) = 2 - 4$$

$$h(-1) = -2$$

$$h(0) = 2(0)^2 - 4$$

$$h(0) = 2(0)(0) - 4$$

$$h(0) = 2(0) - 4$$

$$h(0) = 0 - 4$$

$$h(0) = -4$$

$$h(1) = 2(1)^2 - 4$$

$$h(1) = 2(1)(1) - 4$$

$$h(1) = 2(1) - 4$$

$$h(1) = 2 - 4$$

$$h(1) = -2$$

3. $x + y = 5$

$4x + 3y = 19$

IS $(3, 2)$ a solution
 $x \quad y$

}

$(3) + (2) = 5$

$3 + 2 = 5$

$5 = 5$ ✓

$4(3) + 3(2) = 19$

$12 + 6 = 19$

$18 \neq 19$ X

NO $(3, 2)$ is not
a solution

$x + y = 5$

$4x + 3y = 19$

IS $(4, 1)$ a solution
 $x \quad y$

$(4) + (1) = 5$

$4 + 1 = 5$

$5 = 5$ ✓

$4(4) + 3(1) = 19$

$16 + 3 = 19$

$19 = 19$ ✓

Yes $(4, 1)$ is a
solution

④

$$5x + 3y = 13$$

$$4x - 3y = 32$$

$$9x + 0 = 45$$

$$9x = 45$$

$$\frac{9x}{9} = \frac{45}{9}$$

$$x = 5$$

Subst

$$5x + 3y = 13$$

$$5(5) + 3y = 13$$

$$25 + 3y = 13$$

$$25 + 3y - 25 = 13 - 25$$

$$3y = -12$$

$$\frac{3y}{3} = \frac{-12}{3}$$

$$y = -4$$

$$(x, y) = (5, -4)$$

4

5.

$$x + 3y = 4$$

$$4x + 4y = -8$$

$$\begin{array}{l} (x + 3y = 4) \quad (-4) \\ (4x + 4y = -8) \quad (3) \end{array} \text{ mult}$$

$$-4x - 12y = -16$$

$$12x + 12y = -24$$

$$8x + 0 = -40$$

$$8x = -40$$

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

$$x = -5$$

Subst

$$x + 3y = 4$$

$$(-5) + 3y = 4$$

$$-5 + 3y = 4$$

$$-5 + 3y + 5 = 4 + 5$$

$$3y = 9$$

$$\frac{3y}{3} = \frac{9}{3}$$

$$y = 3$$

$$(x, y) = (-5, 3)$$

6

$$(7x^2 + 11x + 10) \div (x + 1)$$

6

$$\begin{array}{r}
 \overline{) 7x^2 + 11x + 10} \\
 \underline{-(7x^2 + 7x)} \\
 4x + 10 \\
 \underline{-(4x + 4)} \\
 6
 \end{array}$$

use
long division

6 Rem

$$(7x^2 + 11x + 10) \div (x + 1)$$

OR

$$\begin{array}{r}
 7x^2 + 11x + 10 \\
 \hline
 x + 1
 \end{array}$$

Opp

use synthetic division

$$\begin{array}{r}
 \overline{-1) 7 \quad 11 \quad 10} \\
 \underline{-7 \quad -4} \\
 7 \quad 4 \quad \text{6 Rem}
 \end{array}$$

$$7x + 4 + \frac{6}{x + 1}$$

$$⑦ \quad 2x + 22 = \text{factor}$$

$$2(x + 11) =$$

$$⑧ \quad -32x^2y^5 - 56x^4y^4 = \text{factor}$$

$$8x^2y^4(-4y - 7x^2) =$$

$$⑨ \quad 49x^2 - 225y^2 = \text{factor}$$

$$(7x)^2 - (15y)^2 =$$

$$a^2 - b^2 =$$

$$(a + b)(a - b)$$

$$(7x + 15y)(7x - 15y) =$$

$$10. \quad x^2 + 4x - 45 = 0$$

$$(x - 5)(x + 9) = 0$$

$$\text{Let } x - 5 = 0 \quad \text{OR} \quad x + 9 = 0$$

$$x - 5 + 5 = 0 + 5 \quad \text{OR} \quad x + 9 - 9 = 0 - 9$$

$$x = 5 \quad \text{OR} \quad x = -9$$

45.1
15.3
9.5
Possibly 8

$$11. \quad x^2 - 9x = 10$$

$$x^2 - 9x - 10 = 10 - 10$$

$$x^2 - 9x - 10 = 0$$

$$(x + 1)(x - 10) = 0$$

$$\text{Let } x + 1 = 0 \quad \text{OR} \quad x - 10 = 0$$

$$x + 1 - 1 = 0 - 1 \quad \text{OR} \quad x - 10 + 10 = 0 + 10$$

$$x = -1 \quad \text{OR} \quad x = 10$$

Possibly
10.1
2.5

(12.) $x^3 - 11x^2 + 30x = 0$

$$x(x^2 - 11x + 30) = 0$$

$$x(x - 5)(x - 6) = 0$$

30.1 Possible
15.2
10.3
6.5

set $x = 0$ OR $x - 5 = 0$ OR $x - 6 = 0$

OR $x - 5 + 5 = 0 + 5$ OR $x - 6 + 6 = 0 + 6$

$x = 5$ OR $x = 6$

(13.) $x^2 - 28 = -3x$

$$x^2 - 28 + 3x = -3x + 3x$$

$$x^2 - 28 + 3x = 0$$

$$x^2 + 3x - 28 = 0 \quad \text{rewrite}$$

$$(x - 4)(x + 7) = 0$$

set $x - 4 = 0$ OR $x + 7 = 0$

$x - 4 + 4 = 0 + 4$ OR $x + 7 - 7 = 0 - 7$

$x = 4$ OR $x = -7$

Possible
28.1
14.2
4.7

14.

$$7x^2 - 12x - 4 = 0$$

$$(7x + 2)(x - 2) = 0$$

$$\text{let } 7x + 2 = 0 \quad \text{OR} \quad x - 2 = 0$$

$$7x + 2 - 2 = 0 - 2 \quad \text{OR} \quad x - 2 + 2 = 0 + 2$$

$$7x = -2$$

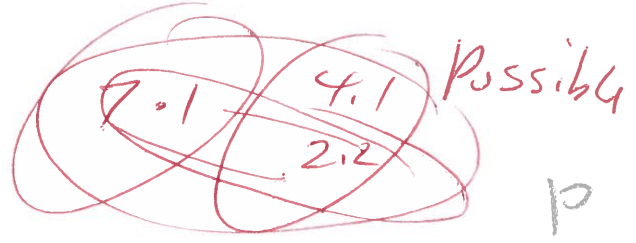
OR

$$x = 2$$

$$\frac{7x}{7} = \frac{-2}{7}$$

OR

$$x = \frac{-2}{7}$$



15.

$$\frac{-6a - 6b}{a + b} =$$

Simp

$$\frac{-6(a + b)}{(a + b)} =$$

$$\frac{-6(a + b)}{(a + b)} =$$

$$-6 =$$

16

$$\frac{x}{7x-28} \cdot \frac{x^2-4x}{4} =$$

$$\frac{x}{7(x-4)} \cdot \frac{x(x-4)}{4} =$$

$$\frac{x}{\cancel{7(x-4)}} \cdot \frac{x \cancel{(x-4)}}{4} =$$

$$\frac{x^2}{28} =$$

17

$$\frac{x^2+10x+16}{x-4} \div \frac{x^2-5x-14}{x-4} =$$

$$\frac{x^2+10x+16}{x-4} \cdot \frac{x-4}{x^2-5x-14} =$$

$$\frac{(x+2)(x+8)}{(x-4)} \cdot \frac{(x-4)}{(x+2)(x-7)} =$$

$$\frac{\cancel{(x+2)}(x+8)}{\cancel{(x-4)}} \cdot \frac{\cancel{(x-4)}}{\cancel{(x+2)}(x-7)} =$$

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

$$\textcircled{18} \quad \frac{1}{6+y} + \frac{y+7}{6+y} =$$

$$\frac{(1) + (y+7)}{6+y} =$$

$$\frac{1+y+7}{6+y} =$$

$$\frac{y+8}{6+y} =$$

$$\textcircled{19} \quad f(x) = -2x + 6 \text{ graph}$$

$$f(0) = -2(0) + 6$$

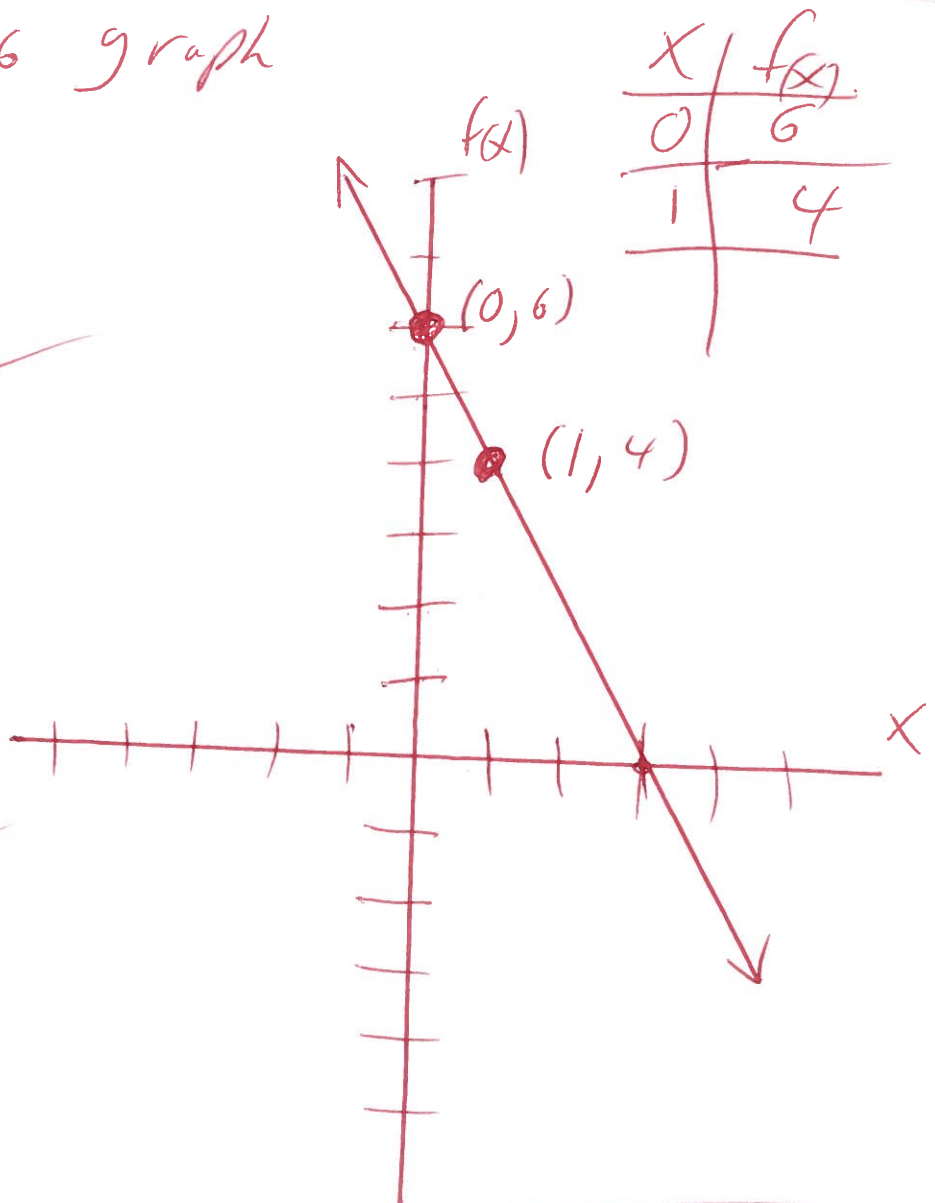
$$f(0) = 0 + 6$$

$$f(0) = 6$$

$$f(1) = -2(1) + 6$$

$$f(1) = -2 + 6$$

$$f(1) = 4$$



$$(20) |2x-3| = 11$$

wt

$$2x-3 = -11 \text{ OR } 2x-3 = 11$$

$$2x-3+3 = -11+3 \text{ OR } 2x-3+3 = 11+3$$

$$2x = -8 \text{ OR } 2x = 14$$

$$\frac{2x}{2} = \frac{-8}{2} \text{ OR } \frac{2x}{2} = \frac{14}{2}$$

$$x = -4 \text{ OR } x = 7$$

$$x = 7$$

formulu

$$|x| = a$$

$$x = -a \text{ OR } x = a$$

13

$$(21) |x-3| < 9$$

$$-9 < x-3 < 9$$

$$-9+3 < x-3+3 < 9+3$$

$$-6 < x < 12$$



$$(-6, 12)$$

formulu

$$|x| < a$$

$$-a < x < a$$

22.

$$|x+3| \geq 13$$

Formula

$$|x| > a$$

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

14

$$x+3 \leq -13 \text{ OR } x+3 \geq 13$$

$$x+3-3 \leq -13-3 \text{ OR } x+3-3 \geq 13-3$$

$$x \leq -16 \text{ OR } x \geq 10$$



$$(-\infty, -16] \cup [10, \infty)$$

union

$$(23) \sqrt{25a^2b^{20}} =$$

$$\sqrt[2]{25a^2b^{20}} = \text{rewrite}$$

$$\sqrt[2]{5^2a^2b^{20}} =$$

$$5^{2/2}a^{2/2}b^{20/2} = \text{divide powers}$$

$$5^1a^1b^{10} =$$

$$5ab^{10} =$$

$$(24) 1024^{3/5} \quad \text{Primes } 2, 3, 5, 7, \dots$$

$$(2^{10})^{3/5} =$$

$$2^{(10)(\frac{3}{5})} =$$

$$2^{30/5} =$$

$$2^6 =$$

$$(2)(2)(2)(2)(2)(2) =$$

$$64 =$$

$$\begin{array}{r} 2 \overline{)1024} \\ \underline{2} \\ 2 \overline{)512} \\ \underline{2} \\ 2 \overline{)256} \\ \underline{2} \\ 2 \overline{)128} \\ \underline{2} \\ 2 \overline{)64} \\ \underline{2} \\ 2 \overline{)32} \\ \underline{2} \\ 2 \overline{)16} \\ \underline{2} \\ 2 \overline{)8} \\ \underline{2} \\ 2 \overline{)4} \\ \underline{2} \\ 2 \overline{)2} \\ \underline{2} \\ 1 \end{array}$$

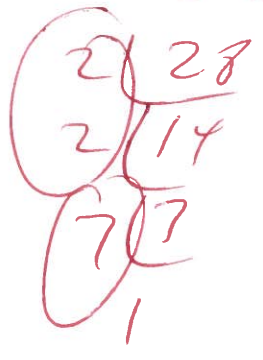
25. $\sqrt{28} =$

Primes: 2, 3, 5, 7, ...

$\sqrt{4 \cdot 7} =$

$\sqrt{4} \sqrt{7} =$

$2\sqrt{7} =$



26. $\sqrt{100x^7} =$

$\sqrt{100x^7} =$

$\sqrt{10^2 x^7} =$

$\sqrt{10^2 \cdot x^6 x^1} =$ *rewrite*

$10^{\frac{2}{2}} x^{\frac{6}{2}} \sqrt{x^1} =$

$10^1 x^3 \sqrt{x^1} =$

$10x^3 \sqrt{x} =$

(27) $\sqrt{9a^6b^7} =$

17

$$\sqrt[2]{3^2 a^6 b^6 b^1} = \text{rewrite}$$

$$3^{2/2} a^{6/2} b^{6/2} \sqrt[2]{b^1} =$$

$$3^1 a^3 b^3 \sqrt[2]{b^1} =$$

$$3a^3 b^3 \sqrt{b} =$$

(28) $\sqrt{x-12} = 7$

$$(\sqrt{x-12})^2 = (7)^2$$

$$x-12 = 49$$

$$x - 12 + 12 = 49 + 12$$

$$x = 61$$

29

$$(6-9i) + (9+8i) =$$

$$6-9i+9+8i =$$

$$15-i =$$

$$15-i =$$

30

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

$$2+8i-5+5i =$$

$$-3+13i =$$

31

$$(7+5i)(9+i) =$$

$$63+7i+45i+5i^2 =$$

$$63+52i+5i^2 =$$

$$63+52i+5(-1) =$$

$$63+52i-5 =$$

$$58+52i =$$

formula

$$i^2 = -1$$

32

$$\frac{9-8i}{9+i}$$

$$\left(\frac{9-8i}{9+i}\right)\left(\frac{9-i}{9-i}\right) = \text{Mult}$$

$$\frac{81 - 9i - 72i + 8i^2}{81 - 9i + 9i - i^2} =$$

$$\frac{81 - 81i + 8i^2}{81 - i^2} =$$

$$\frac{81 - 81i + 8(-1)}{81 - (-1)} =$$

$$\frac{81 - 81i - 8}{81 + 1} =$$

$$\frac{73 - 81i}{83} =$$

$$\frac{73}{83} - \frac{81i}{83} =$$

formule
 $i^2 = -1$

33

$$(x+7)^2 = 4$$

$$\sqrt{(x+7)^2} = \pm\sqrt{4}$$

$$x+7 = \pm 2$$

$$x+7 = -2 \quad \text{OR}$$

$$x+7 = 2$$

$$x+7-7 = -2-7$$

OR

$$x+7-7 = 2-7$$

$$x = -9$$

OR

$$x = -5$$

ck

$$(x+7)^2 = 4$$

$$(-9+7)^2 = 4$$

$$(-2)^2 = 4$$

$$(-2)(-2) = 4$$

$$4 = 4 \quad \checkmark$$

Good

ck

$$(x+7)^2 = 4$$

$$(-5+7)^2 = 4$$

$$(2)^2 = 4$$

$$(2)(2) = 4$$

$$4 = 4 \quad \checkmark$$

Good

answer

$$\{-9, -5\}$$

34

$$m^2 - 8m + 15 = 0$$

use Quad form

$$1m^2 - 8m + 15 = 0$$

$$a=1, b=-8, c=15$$

$$m = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$m = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(15)}}{2(1)}$$

$$m = \frac{8 \pm \sqrt{64 - 60}}{2}$$

$$m = \frac{8 \pm \sqrt{4}}{2}$$

$$m = \frac{8 \pm 2}{2}$$

$$m = 4 \pm 1$$

$$m = 4 + 1$$

OR

$$m = 4 - 1$$

$$m = 5$$

OR

$$m = 3$$

35. $x^2 - 12x + 36 = 0$ Use Quad Form

22

$$1x^2 - 12x + 36 = 0$$

$$a=1, b=-12, c=36$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{144 - 144}}{2}$$

$$x = \frac{12 \pm \sqrt{0}}{2}$$

$$x = \frac{12 \pm 0}{2}$$

$$x = \frac{12+0}{2} \text{ OR } x = \frac{12-0}{2}$$

$$x = \frac{12}{2} \text{ OR } x = \frac{12}{2}$$

$$x = 6$$

OR

$$x = 6$$

Answer

$$\{6\}$$

$$(3) \quad x^2 + 2x + 5 = 0$$

$$1x^2 + 2x + 5 = 0$$

$$a=1, b=2, c=5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4 - 20}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16}}{2}$$

$$x = \frac{-2 \pm 4i}{2}$$

$$x = -1 \pm 2i$$

$$x = -1 - 2i \quad \text{OR}$$

$$x = -1 + 2i$$

use Quad form

23

formulas

$$\sqrt{-1} = i \quad \text{Example}$$

$$\sqrt{-4} = 2i$$

$$\sqrt{-9} = 3i$$

$$\sqrt{-25} = 5i$$

37. $f(x) = 4x^2 + 8x - 2$ find vertex 24.

$$a=4, b=8, c=-2$$

$$\text{Vertex} = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$$

$$\text{Vertex} = \left(-\frac{(8)}{2(4)}, f\left(\frac{(8)}{2(4)}\right)\right)$$

$$\text{Vertex} = \left(\frac{-8}{8}, f\left(\frac{-8}{8}\right)\right)$$

$$\text{Vertex} = (-1, f(-1))$$

$$\text{Vertex} = (-1, 4(-1)^2 + 8(-1) - 2)$$

$$\text{Vertex} = (-1, 4(-1)(-1) + 8(-1) - 2)$$

$$\text{Vertex} = (-1, 4(1) + 8(-1) - 2)$$

$$\text{Vertex} = (-1, 4 - 8 - 2)$$

$$\text{Vertex} = (-1, -4 - 2)$$

$$\text{Vertex} = (-1, -6)$$