

- VVV
- MO32035
03/20/18
- 1) $h(x) = 5x^2 - 1$ find ~~h(5)~~ $h(-5)$
 - 2) $x + y = 5$ is $(2, 3)$ a solution
 $2x + 3y = 13$
 - 3) $5x + 4y = 33$ solve
 $2x - 4y = 2$
 - 4) $x + 2y = 2$ solve
 $5x + 3y = -4$
 - 5) $(7x^2 + 13x + 10) \div (x + 1)$ synthetic division
 - 6) $4x + 20$ factor
 - 7) $-4x^2y^6 - 18x^3y^3$ factor
 - 8) $196x^2 - 169y^2$ factor
 - 9) $x^2 - 8x = 0$ solve
 - 10) $x^3 - 11x^2 + 18x = 0$
 - 11) $x^2 - 8 = -2x$
 - 12) $2x^2 - 13x - 45 = 0$
 - 13) $\frac{2}{6a - 4}$ simplify
 - 14) $\frac{-4x + 4y}{x - y}$ simplify
 - 15) $\frac{x}{2x - 16} \cdot \frac{x^2 - 8x}{2}$
 - 16) $\frac{m^2 - n^2}{m + n} \div \frac{m}{m^2 + nm}$
 - 17) $\frac{6}{3 + y} + \frac{y + 5}{3 + y}$
 - 18) $|2x - 1| = 3$
 - 19) $|x - 5| < 5$
 - 20) $|x + 10| \geq 6$
 - 21) $\sqrt{49a^8b^4}$
 - 22) $1024^{\frac{2}{5}}$
 - 23) $\sqrt{12}$
 - 24) $\sqrt{x - 1} = 6$
 - 25) $(9 - 9i) + (3 + 2i)$
 - 26) $(6 + 7i) - (8 - 9i)$
 - 27) $(4 + 4i)(5 + i)$
 - 28) $\frac{8 - 7i}{8 + i}$
 - 29) $(x + 6)^2 = 9$
 - 30) $m^2 + 5m - 6 = 0$
 - 31) $-y = 3y^2 - 4$
 - 32) $x^2 + 10x + 25 = 0$
 - 33) $x^2 + 2x + 26 = 0$
 - 34) $f(x) = x^2 - 7$ graph
find VERTEX
 - 35) $f(x) = -4x^2 - 8x + 8$

① $h(x) = 5x^2 - 1$

$$h(-5) = 5(-5)^2 - 1$$

$$h(-5) = 5(-5)(-5) - 1$$

$$h(-5) = 5(25) - 1$$

$$h(-5) = 125 - 1$$

$$h(-5) = 124$$

② $x + y = 5$ is $(2, 3)$ a solution
 $2x + 3y = 13$ $x \ y$

$$(2) + (3) = 5$$

$$2 + 3 = 5$$

$$5 = 5 \checkmark$$

$$2(2) + 3(3) = 13$$

$$4 + 9 = 13$$

$$13 = 13 \checkmark$$

YES $(2, 3)$ is a solution

$$\textcircled{3} \quad \begin{aligned} 5x + 4y &= 33 \\ 2x - 4y &= 2 \end{aligned}$$

Solve

$$\hline 7x + 0 = 35$$

$$7x = 35$$

$$\frac{7x}{7} = \frac{35}{7}$$

$$x = 5$$

Subst

$$5x + 4y = 33$$

$$5(5) + 4y = 33$$

$$25 + 4y = 33$$

$$25 + 4y - 25 = 33 - 25$$

$$4y = 8$$

$$\frac{4y}{4} = \frac{8}{4}$$

$$y = 2$$

$$(x, y) = (5, 2)$$

$$\textcircled{4} \quad \begin{aligned} x + 2y &= 2 \\ 5x + 3y &= -4 \end{aligned}$$

Solve

Subst

$$x + 2y = 2$$

$$(-2) + 2y = 2$$

$$-2 + 2y = 2$$

$$-2 + 2y + 2 = 2 + 2$$

$$2y = 4$$

$$\frac{2y}{2} = \frac{4}{2}$$

$$y = 2$$

$$\left(\begin{array}{l} x + 2y = 2 \\ 5x + 3y = -4 \end{array} \right) \left(\begin{array}{l} -3 \\ 2 \end{array} \right) \text{ mult}$$

$$-3x - 6y = -6$$

$$10x + 6y = -8$$

$$\hline 7x = -14$$

$$\frac{7x}{7} = \frac{-14}{7}$$

$$x = -2$$

$$(x, y) = (-2, 2)$$

5) $(7x^2 + 13x + 10) \div (x+1)$

$$\begin{array}{r} 7x^2 + 13x + 10 \\ \underline{-(x+1)} \\ 6x + 9 \end{array}$$
 use synthetic division

$$\begin{array}{r} -1 \mid 7 \quad 13 \quad 10 \\ \underline{ } \\ 7 \quad 6 \quad 4 \text{ rem} \end{array}$$

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

6) $4x + 20 =$ factor

$$4(x + 5) =$$

7) $-4x^2y^6 - 18x^3y^3 =$ factor

$$6x^2y^3(-7y^3 - 3x) =$$

8) $196x^2 - 169y^2 =$ factor

$$a^2 - b^2 = (a+b)(a-b)$$

$$(14x)^2 - (13y)^2 =$$

$$(14x + 13y)(14x - 13y) =$$

9) $x^2 - 8x = 0$

$$x(x-8) = 0$$

Let $x = 0$ OR $x - 8 = 0$
OR $x - 8 + 8 = 0 + 8$

$$x = 8$$

$\{0, 8\}$

10) $x^3 - 11x^2 + 18x = 0$

$$x(x^2 - 11x + 18) = 0$$

$$x(x-2)(x-9) = 0$$

Let $x = 0$ OR $x - 2 = 0$

OR $x - 2 + 2 = 0 + 2$

$$x = 2$$

OR $x - 9 = 0$

OR $x - 9 + 9 = 0 + 9$

$$x = 9$$

18.1

2.9

6.3

Possibly

$\{2, 9\}$

11) $x^2 - 8 = -2x$

$$x^2 - 8 + 2x = -2x + 2x$$

$$x^2 + 2x - 8 = 0$$

$$(x-2)(x+4) = 0$$

Let $x - 2 = 0$ OR $x + 4 = 0$

$x - 2 + 2 = 0 + 2$ OR $x + 4 - 4 = 0 - 4$

$$x = 2$$

OR $x = -4$

8.1

2.4

Possibly

$\{2, -4\}$

$$12. \quad 2x^2 - 13x - 45 = 0$$

$$(2x + 5)(x - 9) = 0$$

$$\text{but } 2x + 5 = 0 \quad \text{OR} \quad x - 9 = 0$$

$$2x + \cancel{x} - \cancel{5} = 0 - 5 \quad \text{OR} \quad x - \cancel{9} + \cancel{9} = 0 + 9$$

$$2x = -5 \quad \text{OR} \quad x = 9$$

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

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

2.1
45.1
15.3
9.5 possible

$\left\{-\frac{5}{2}, 9\right\}$

$$13. \quad \frac{2}{6a-4} = \text{Simplify}$$

$$\frac{\cancel{2}(1)}{\cancel{2}(3a-2)} =$$

$$\frac{1}{3a-2} =$$

$$14. \quad \frac{-4x+4y}{x-y} = \text{Simplify}$$

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

$$-4 =$$

15. $\frac{x}{2x-16} \cdot \frac{x^2-8x}{2} =$

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

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

$$\frac{x^2}{4} =$$

16. $\frac{m^2-n^2}{m+n} \div \frac{m}{m^2+nm} =$

$$\frac{m^2-n^2}{m+n} \cdot \frac{m^2+nm}{m} =$$

rewrite

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

$$\frac{(m+n)(m-n)}{(m+n)} \cdot \frac{\cancel{m}(m+n)}{\cancel{m}} =$$

$$(m+n)(m-n) =$$

$$m^2 - mn + mn - n^2 =$$

$$m^2 - n^2 =$$

$$17. \quad \frac{6}{3+y} + \frac{y+5}{3+y} =$$

$$\frac{(6) + (y+5)}{3+y} =$$

$$\frac{6+y+5}{3+y} =$$

$$\frac{y+11}{3+y} =$$

$$18. \quad |2x-1|=3$$

wt

$$2x-1=-3 \quad \text{OR} \quad 2x-1=3$$

$$2x-1+1=-3+1 \quad \text{OR} \quad 2x-1+1=3+1$$

$$2x = -2 \quad \text{OR} \quad 2x = 4$$

$$\frac{2x}{2} = \frac{-2}{2} \quad \text{OR} \quad \frac{2x}{2} = \frac{4}{2}$$

$$x = -1$$

OR

$$x = 2$$

$$\{-1, 2\}$$

Formula

$$|x|=a$$

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

$$19. |x-5| < 5$$

$$-5 < x-5 < 5$$

$$-5 + 5 < x-5 + 5 < 5 + 5$$

$$0 < x < 10$$



$$(0, 10)$$

formula

$$|x| < a$$
$$-a < x < a$$

$$20. |x+10| \geq 6$$

$$\text{or } x+10 \leq -6 \quad \text{OR} \quad x+10 \geq 6$$

$$x+10-10 \leq -6-10 \quad \text{OR} \quad x+10-10 \geq 6-10$$

$$x \leq -16 \quad \text{OR} \quad x \geq -4$$



$$(-\infty, -16] \cup [-4, \infty)$$

formula

$$|x| \geq a$$
$$x \leq -a \quad \text{OR} \quad x \geq a$$

21. $\sqrt{49a^8b^{40}} =$

$\sqrt[2]{49a^8b^{40}} =$

$7a^4b^{20} =$

Divide the powers

22.

$1024^{\frac{2}{5}}$

Primes 2, 3, 5, 7, 11, ...

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

$2 \overline{) 1024}$

$2 \overline{) 512}$

$2 \overline{) 256}$

$2 \overline{) 128}$

$2 \overline{) 64}$

$2 \overline{) 32}$

$2 \overline{) 16}$

$2 \overline{) 8}$

$2 \overline{) 4}$

$2 \overline{) 2}$

1

$(2^{\frac{10}{1}})^{\frac{2}{5}} =$

$2^{\frac{10(2)}{1(5)}} =$

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

$2^4 =$

$2 \cdot 2 \cdot 2 \cdot 2 =$

$16 =$

23. $\sqrt{12} =$ Primes 2, 3, 5, 7, 11, ...

$$\sqrt{4 \cdot 3} =$$

$$\sqrt{4} \sqrt{3} =$$

$$2\sqrt{3} =$$

$$\begin{array}{r} 2 \overline{) 12} \\ \underline{4} \\ 8 \\ \underline{6} \\ 0 \end{array}$$

24. $\sqrt{x-1} = 6$

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

$$x-1 = 36$$

$$x - \cancel{x} + \cancel{x} = 36 + 1$$

$$x = 37$$

{37}

$$\textcircled{25.} \quad (9-9i) + (3+7i) =$$
$$9 - 9i + 3 + 7i =$$

$$\textcircled{12 - 2i =}$$

$$\textcircled{26.} \quad (6+7i) - (8-9i) =$$
$$6 + 7i - 8 + 9i =$$

$$\textcircled{-2 + 16i =}$$

$$\textcircled{27.} \quad (4+4i)(5+i) =$$

$$20 + 4i^2 + 20i + 4i^2 =$$

$$20 + 24i + 4i^2 =$$

$$20 + 24i + 4(-1) =$$

$$20 + 24i - 4 =$$

$$\textcircled{16 + 24i =}$$

formula
 $i^2 = -1$

$$28 \quad \frac{8-7i}{8+i} =$$

$$\left(\frac{8-7i}{8+i}\right)\left(\frac{8-i}{8-i}\right) =$$

$$\frac{64 - 8i - 56i + 7i^2}{64 - 8i + 8i - i^2} =$$

$$\frac{64 - 64i + 7i^2}{64 - i^2} =$$

$$\frac{64 - 64i + 7(-1)}{64 - (-1)} =$$

$$\frac{64 - 64i + 7}{64 + 1} =$$

$$\frac{57 - 64i}{65} =$$

$$\frac{57}{65} - \frac{64i}{65} =$$

29.

$$(x+6)^2 = 9$$

$$\sqrt{(x+6)^2} = \pm\sqrt{9}$$

$$x+6 = \pm 3$$

$$x+6 = -3 \quad \text{OR} \quad x+6 = 3$$

$$x+6-6 = -3-6 \quad \text{OR} \quad x+6-6 = 3-6$$

$$x = -9$$

$$\text{OR} \quad x = -3$$

$\{-9, -3\}$

30.

$$m^2 + 5m - 6 = 0$$

$$(m-1)(m+6) = 0$$

6, 1

2, 3

$$\text{LH } m-1=0 \quad \text{OR} \quad m+6=0$$

$$m-1+1=0+1 \quad \text{OR} \quad m+6-6=0-6$$

$$m = 1$$

$$\text{OR} \quad m = -6$$

$\{1, -6\}$

$$31. -y = 3y^2 - 4$$

$$-y + y = 3y^2 - 4 + y$$

$$0 = 3y^2 + y - 4$$

$$0 = (3y + 4)(y - 1)$$

$$\text{Let } 3y + 4 = 0 \text{ OR } y - 1 = 0$$

$$3y + 4 - 4 = 0 - 4 \text{ OR } y - 1 + 1 = 0 + 1$$

$$3y = -4$$

$$\frac{3y}{3} = \frac{-4}{3}$$

$$\text{OR } y = 1$$

$$y = -\frac{4}{3}$$

Use Quadratic formula

$$3y^2 + y - 4 = 0$$

$$a = 3, b = 1, c = -4$$

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

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

$$y = \frac{-1 \pm \sqrt{1 + 48}}{6}$$

$$y = \frac{-1 \pm \sqrt{49}}{6}$$

$$y = \frac{-1 \pm 7}{6}$$

$$y = \frac{-1 - 7}{6} \text{ OR } y = \frac{-1 + 7}{6}$$

$$\begin{matrix} 3.1 & 4.1 \\ & 2.2 \end{matrix}$$

$$y = -\frac{8}{6} \text{ OR } y = \frac{6}{6}$$

$$y = \frac{2(-4)}{2(3)}$$

$$\text{OR } y = 1$$

$$y = -\frac{4}{3}$$

$$\left\{ -\frac{4}{3}, 1 \right\}$$

$$32) x^2 + 10x + 25 = 0$$

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

$$\text{let } x+5=0 \text{ or } x+5=0$$

$$x+5-5=0-5 \text{ or } x+5-5=0-5$$

$$x = -5 \text{ or } x = -5$$

Use Quadratic Formula

$$x^2 + 10x + 25 = 0$$

$$a=1, b=10, c=25$$

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

$$x = \frac{-10 \pm \sqrt{(10)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{100 - 100}}{2}$$

$$x = \frac{-10 \pm \sqrt{0}}{2}$$

$$x = \frac{-10 \pm 0}{2}$$

$$x = \frac{-10-0}{2} \text{ or } x = \frac{-10+0}{2}$$

$$x = \frac{-10}{2} \text{ or } x = \frac{-10}{2}$$

$$x = -5 \text{ or } x = -5$$

$\{-5\}$

33 $1x^2 + 2x + 26 = 0$

$a=1, b=2, c=26$

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

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(26)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4 - 104}}{2}$$

$$x = \frac{-2 \pm \sqrt{-100}}{2}$$

$$x = \frac{-2 \pm 10i}{2}$$

$$x = -1 \pm 5i$$

$$x = -1 - 5i$$

OR $x = -1 + 5i$

Use Quadratic Formula

$$\{-1 - 5i, -1 + 5i\}$$

34) $f(x) = x^2 - 7$ graph

$$f(-1) = (-1)^2 - 7$$

$$f(-1) = (-1)(-1) - 7$$

$$f(-1) = 1 - 7$$

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

$$f(0) = (0)^2 - 7$$

$$f(0) = (0)(0) - 7$$

$$f(0) = 0 - 7$$

$$f(0) = -7$$

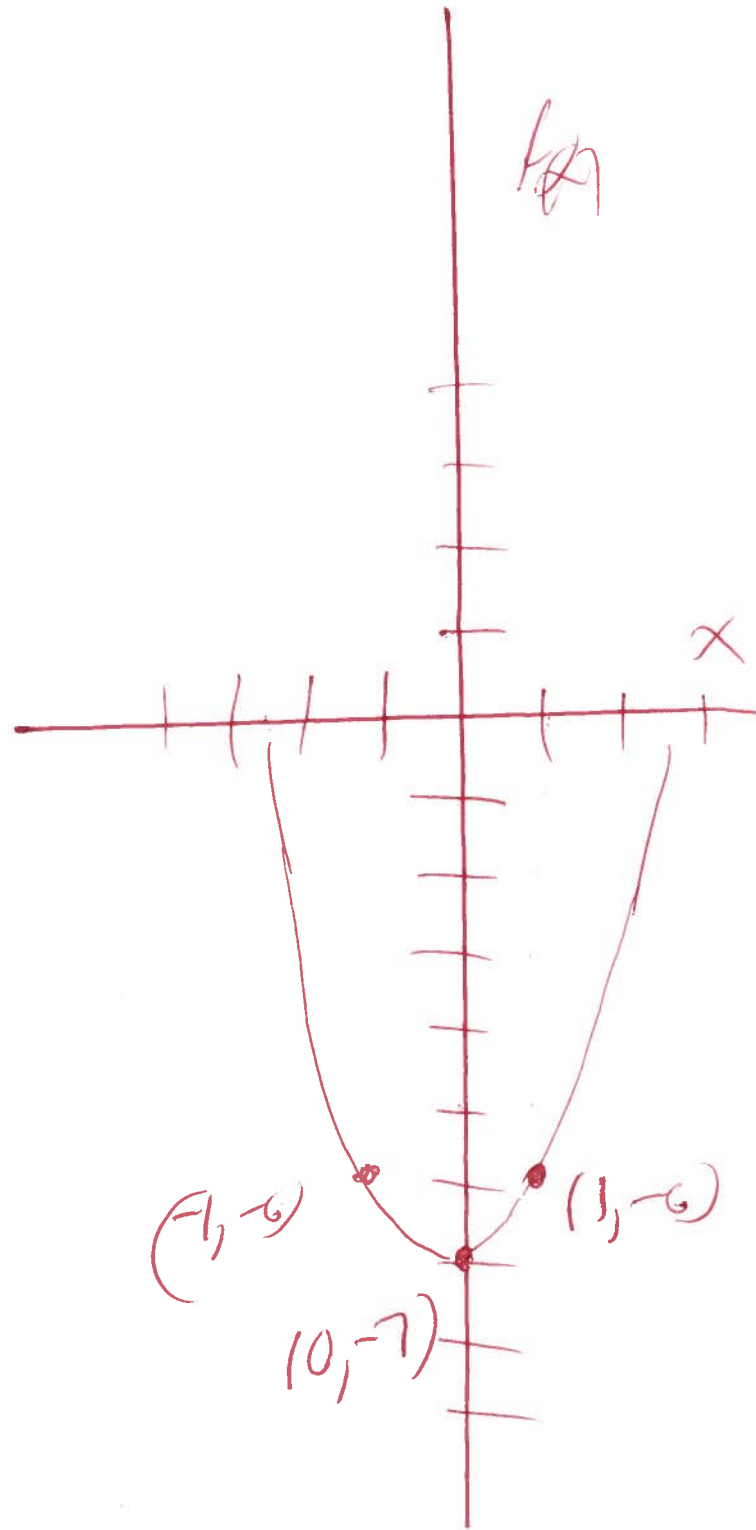
$$f(1) = (1)^2 - 7$$

$$f(1) = (1)(1) - 7$$

$$f(1) = 1 - 7$$

$$f(1) = -6$$

X	f(x)
-1	-6
0	-7
1	-6



35. $f(x) = -4x^2 - 8x + 8$ Find vertex
 $a = -4, b = -8, c = 8$

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

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

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

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

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

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

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

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

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

$$\text{Vertex} = (-1, 12)$$