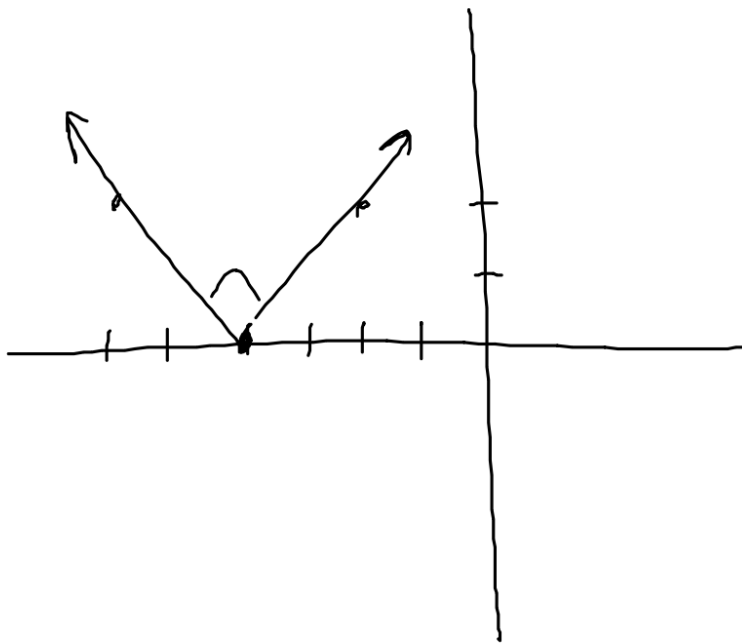


Cumulative Review (Misc Solutions)

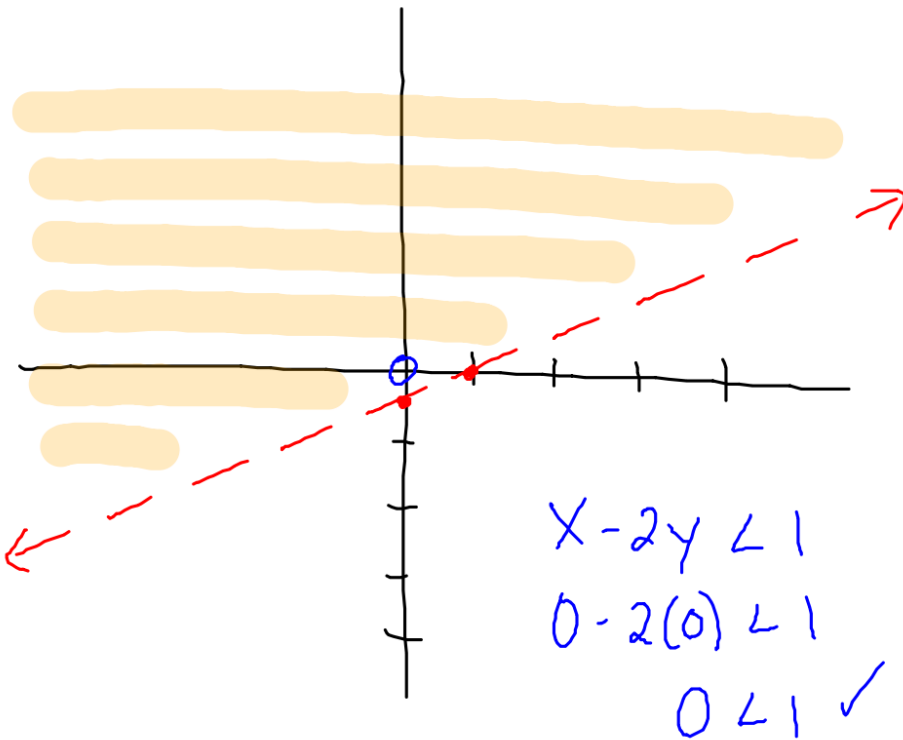
9) Graph $y = |x + 4| \rightarrow V(-4, 0)$

$$y = a|x - h| + k$$



x	y
-2	2
-6	2

10) Graph $X - 2y < 1$



X	Y
1	0
0	$-\frac{1}{2}$

14) Write the equation of a line that has a slope of 3 and passes through (3, 4)

$$y - y_1 = m(x - x_1)$$

$$y - 4 = 3(x - 3)$$

} Point Slope Form

Slope Intercept Form

$$y = 3x - 5$$

Standard Form

$$3x - y = 5$$

15) Write the equation of a line that is perpendicular to $y = \boxed{\frac{2}{3}}x + 4$ and passes through $(-2, 1)$

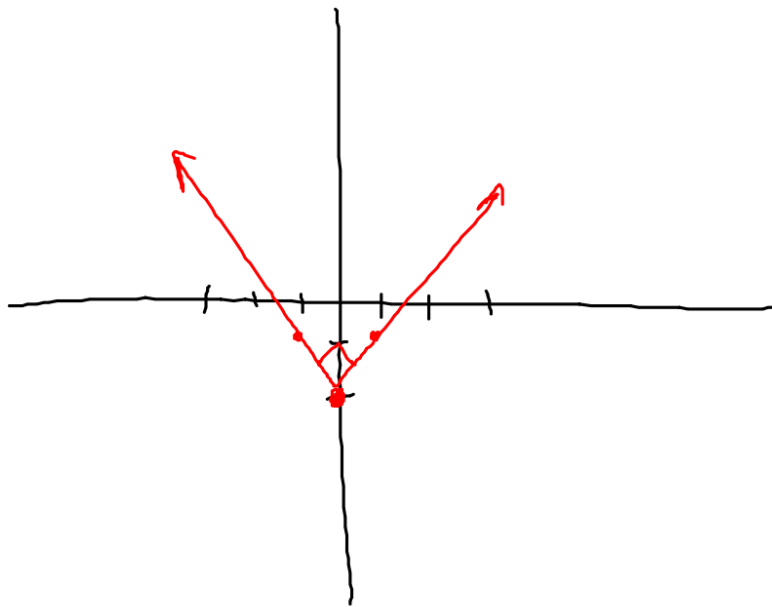
↑ Use $-\frac{2}{3}$ for slope

$$y - y_1 = m(x - x_1)$$

$$y - 1 = -\frac{2}{3}(x + 2)$$

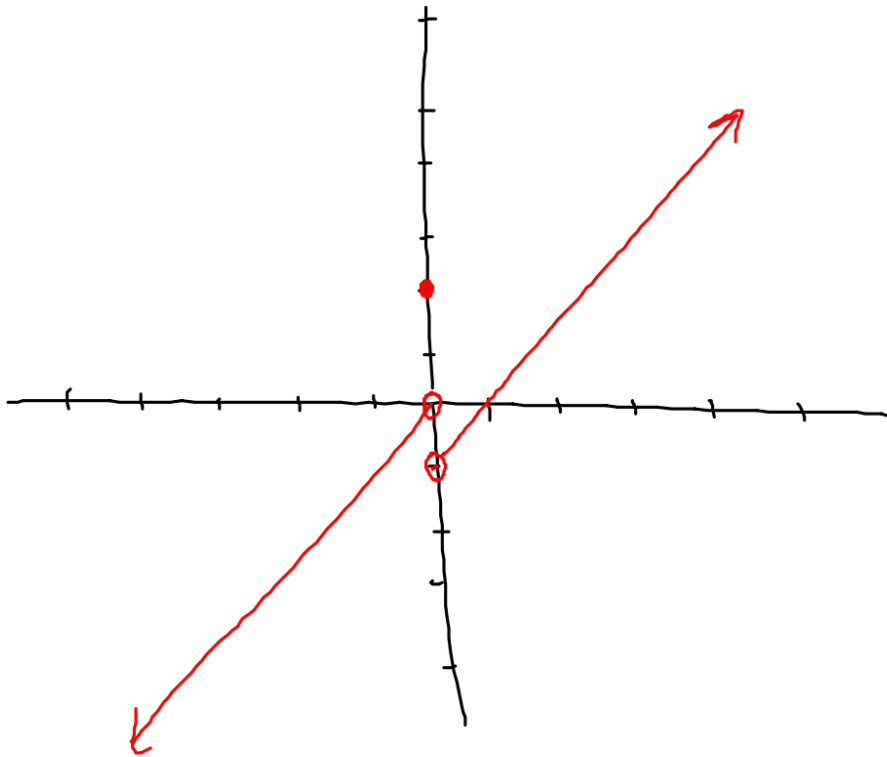
16) Graph $f(x) = |x| - 2$

Recall $y = a|x-h| + k$



x	y
1	-1
-1	-1

17) Graph $g(x) = \begin{cases} x & \text{if } x < 0 \\ 2 & \text{if } x = 0 \\ x-1 & \text{if } x > 0 \end{cases}$



$$23) \quad \text{Solve} \quad \begin{cases} X + 2y - z = 1 \\ X + 3y + 2z = 7 \\ 2x + 6y + z = 8 \end{cases}$$

$$\begin{array}{r} X + 2y - z = 1 \\ -X - 3y - 2z = -7 \\ \hline -y - 3z = -6 \end{array}$$

$$\begin{array}{r} -2x - 4y + 2z = -2 \\ 2x + 6y + z = 8 \\ \hline 2y + 3z = 6 \\ -y - 3z = -6 \\ \hline y = 0 \end{array}$$

24) Solve for x : $tx - ux = 3t$

$$x(t - u) = 3t \quad \text{Trick :}$$

$$x = \frac{3t}{t - u}$$

27) Solve for x : $A = \frac{1}{2} h (x + b_2)$

$$\frac{2A}{h} = \frac{h(x + b_2)}{h}$$

$$\frac{2A}{h} = x + b_2$$

$$\frac{2A}{h} - b_2 = x$$

28) Solve $\frac{3}{4}(x+1) = g$

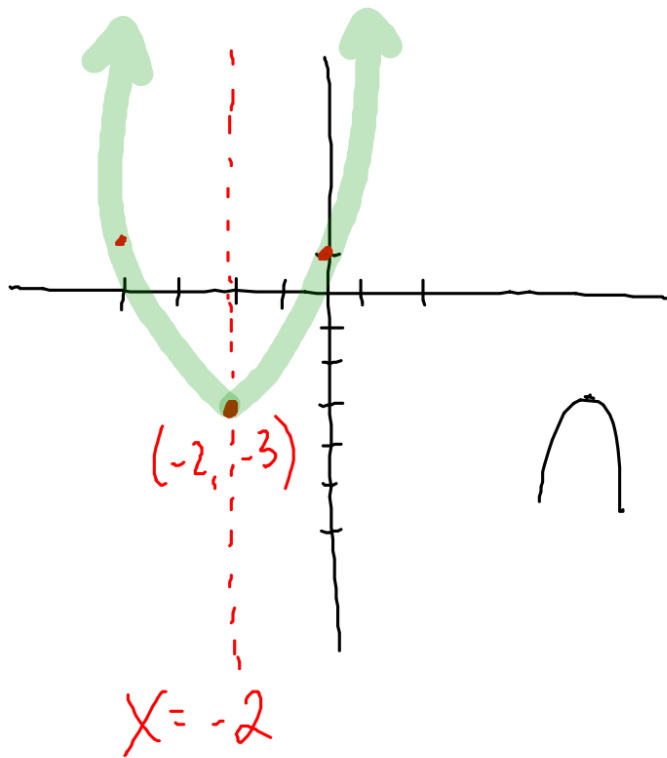
$$\frac{3}{4}x + \frac{3}{4} = g$$

$$\frac{4}{3} \cdot \frac{3}{4}x = \left(g - \frac{3}{4}\right) \frac{4}{3}$$

$$x = \frac{4}{3}g - 1$$

30) $y = x^2 + 4x + 1$

$V\left(\frac{-b}{2a}, -\right) = \left(\frac{-4}{2}, -\right) = (-2, -3)$



x	y
0	1

33) Write $y = x^2 + 6x - 2$ in vertex form:

$$y + 2 = x^2 + 6x + \overset{+9}{9}$$

$$y + 11 = (x + 3)^2$$

$$y = (x + 3)^2 - 11$$

$$V\left(\frac{-b}{2a}, \text{---}\right) = V\left(\frac{-6}{2}, \text{---}\right) = V(-3, -11)$$

$$y = (x + 3)^2 - 11$$

34) Factor $6x^2 + 13x + 6$

$$(3x + 2)(2x + 3)$$

✓
 $x = -\frac{2}{3}$

↘
 $x = -\frac{3}{2}$

38) Factor $x^3 - 8$

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

39) Factor $x^4 - 2x^2 - 8$

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

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

40) Solve $2x^2 - 11x - -15$

$$2x^2 - 11x + 15 = 0$$

$$(2x - 5)(x - 3) = 0$$

✓

$$2x - 5 = 0$$

$$2x = 5$$

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

✓

$$x - 3 = 0$$

$$x = 3$$

41) Solve by CTS:

$$X^2 - 3X + \frac{9}{4} = 28 + \frac{9}{4}$$

$$\sqrt{\left(X - \frac{3}{2}\right)^2} = \sqrt{\frac{121}{4}}$$

$$X - \frac{3}{2} = \pm \frac{11}{2}$$

$$X = \frac{3}{2} + \frac{11}{2} \text{ or } \frac{3}{2} - \frac{11}{2} = 7 \text{ or } -4$$

$$44) \quad x^2 + 2x + 5 = 0$$

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

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

$$= \frac{\overset{1}{-2} + \overset{2}{4}i}{\cancel{2}} \quad \text{or} \quad \frac{\overset{-1}{-2} - \overset{-2}{4}i}{\cancel{2}}$$

43) Solve $x^2 + 12 = 0$

$$\sqrt{x^2} = \sqrt{-12}$$

$$x = \pm \sqrt{-1} \sqrt{4} \sqrt{3}$$

$$x = \pm 2i\sqrt{3}$$

$$\begin{aligned} 48) \text{ Simplify } & -2i(4-i) \\ &= -8i + 2i^2 \\ &= -8i - 2 \end{aligned}$$

49) Simplify $(3+i)(2+3i)$

$$= \underset{\text{F}}{6} + \underset{\text{O}}{9i} + \underset{\text{I}}{2i} + \underset{\text{L}}{3i^2}$$

$$= 6 + 9i + 2i - 3$$

$$= 3 + 11i$$

51)

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

$$D = 5^2 - 4(1)(5) = 5 > 0$$

2 Real Solutions

$$56) \quad (X^3+2)^2 = (X^3+2)(X^3+2)$$

$$= \underset{\text{F}}{X^6} + \underset{\text{O}}{2X^3} + \underset{\text{I}}{2X^3} + \underset{\text{L}}{4}$$

$$= X^6 + 4X^3 + 4$$

$$58) \quad Y = X^4 + 3X^3 + 2X^2$$

$$Y = X^2(X^2 + 3X + 2)$$

$$Y = X^2(X + 2)(X + 1)$$

$$\begin{array}{r}
 5a) \quad -4 \overline{) 1 \quad 3 \quad -6 \quad -7} \\
 \underline{\phantom{5a) \quad -4 \overline{) 1 \quad 3 \quad -6 \quad -7}} -4 4 8 \\
 1 \quad -1 \quad -2 \quad \boxed{1}
 \end{array}$$

↑ Remainder

$$x^2 - x - 2$$

$$\begin{array}{r}
 x+4 \overline{) x^3 + 3x^2 - 6x - 7} \\
 \underline{x^3 + 4x^2} \\
 -x^2 - 6x \\
 \underline{-x^2 - 4x} \\
 -2x - 7 \\
 \underline{-2x - 8} \\
 1
 \end{array}$$

$$63) \quad \frac{p}{q} = \frac{\pm 1 \pm 2 \pm 4}{\pm 1 \pm 3}$$

$$= \pm 1 \pm 2 \pm 4 \pm \frac{2}{3} \pm \frac{4}{3} \pm \frac{1}{3}$$

$$64) \text{ Possible} = \frac{\pm 1 \pm 3}{\pm 1} = \pm 1 \pm 3$$

$$\begin{array}{r} -1 \overline{) 1 \quad -3 \quad -1 \quad 3} \\ \underline{ -1 \quad 4 \quad -3} \\ 1 \quad -4 \quad 3 \quad \boxed{0} \checkmark \end{array}$$

↓

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

$$(x-3)(x-1) = 0$$

$$x = 3, 1$$

$$66) \quad 4 \rightarrow (x-4)(x^2-4x+5) = ?$$

$$2+i \rightarrow (x - (2+i))$$

$$2-i \rightarrow (x - (2-i))$$

$$((x-2)-i)((x-2)+i)$$

$$\begin{aligned}(x-2)^2 - i^2 &= x^2 - 4x + 4 + 1 \\ &= (x^2 - 4x + 5)\end{aligned}$$