algebra UNIT 7 Review of Types of Solving/Graphing

Solve by graphing. Identify the vertex, axis of symmetry, x-intercepts, and y-intercepts.

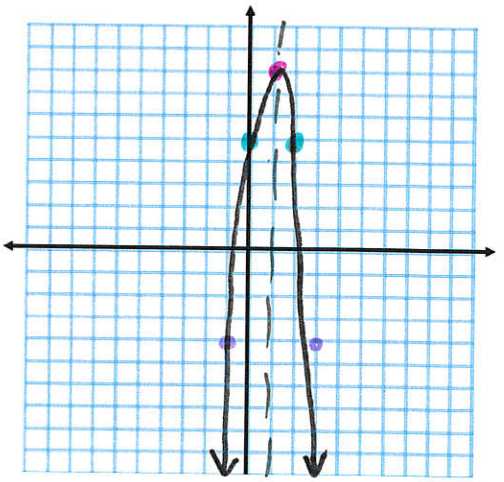
1.) $y = -3x^2 + 6x + 5$

vertex: $\frac{-b}{2a}$ $\frac{-6}{2(-3)} = \frac{-6}{-6} = 1$ (1, 8)

$-3(1)^2 + 6(1) + 5 = 8$

y intercept = (0, 5)

x	3
y	-4



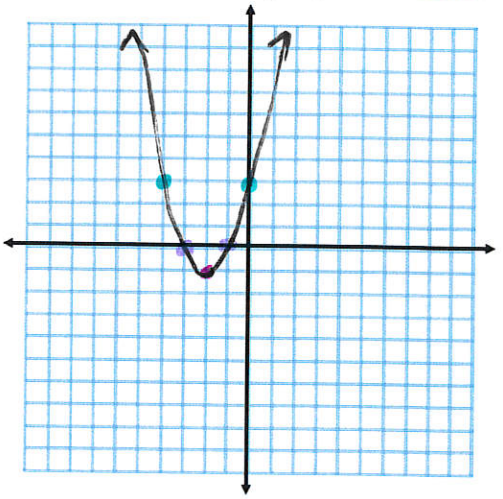
2.) $f(x) = x^2 + 4x + 3$

vertex: $\frac{-b}{2a} = \frac{-4}{2(1)} = -2$ (-2, -1)

$(-2)^2 + 4(-2) + 3 = -1$

y intercept (0, 3)

x	-1
y	0



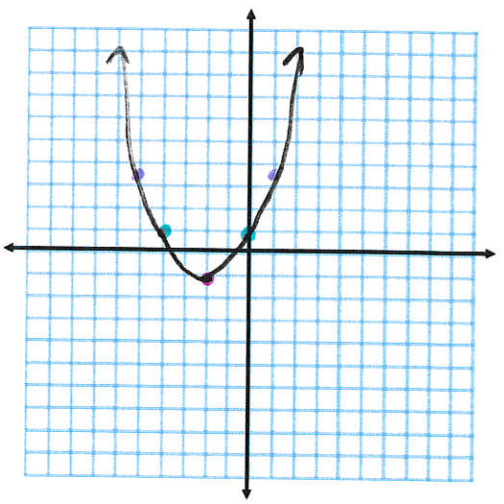
3.) $y = \frac{1}{2}x^2 + 2x + 1$

vertex: $\frac{-b}{2a} = \frac{-2}{2(\frac{1}{2})} = -2$ (-2, -1)

$\frac{1}{2}(-2)^2 + 2(-2) + 1 = -1$

y intercept (0, 1)

x	1
Y	3.5



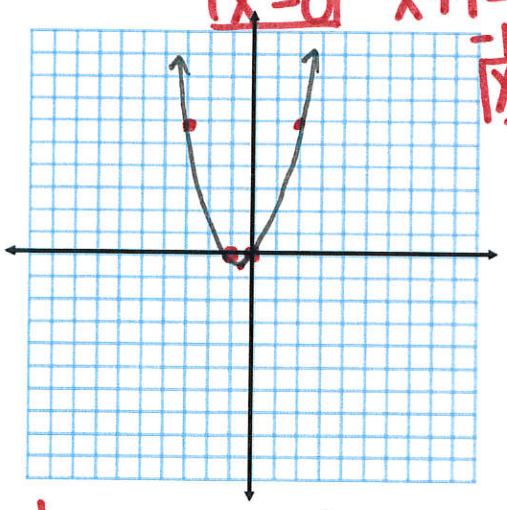
Solve by factoring. <u>Identify</u> the vertex, axis of symmetry, and find the zeroes. Then graph.

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

$x(x+1) = 0$

$x = 0$ $\quad x+1=0$

$x = -1$



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

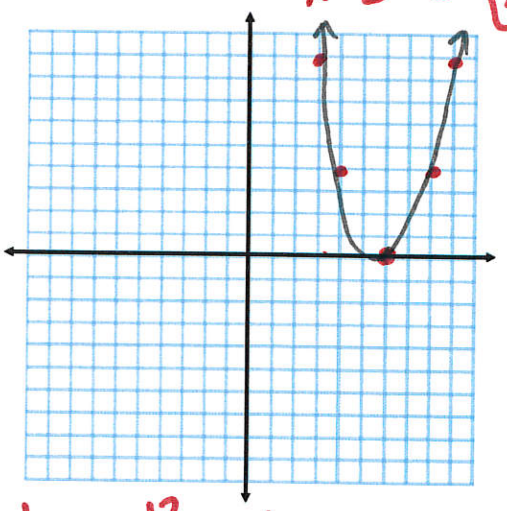
x	2
y	6

$(-\frac{1}{2})^2 + -\frac{1}{2} = -\frac{1}{4}$

5.) $y = x^2 - 12x + 36$

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

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



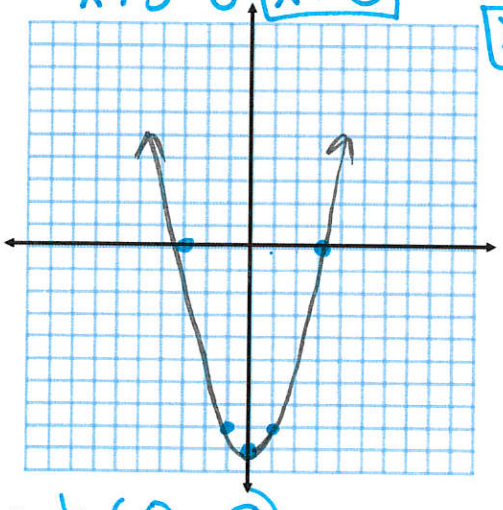
$\frac{-b}{2a} = \frac{12}{2} = 6$

x	4	3
y	4	9

6.) $y = x^2 - 9$

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

$x+3=0$ $\quad x=-3$ $\quad x-3=0$ $\quad x=3$



y-intercept $(0,-9)$

x	1
y	-8

7.) $f(x) = 4x^2 + 5x - 6$

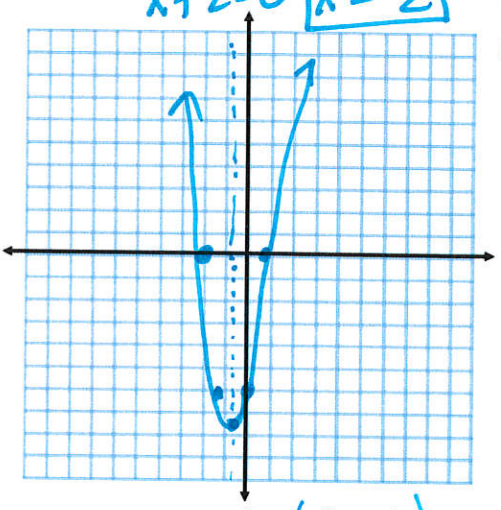
$(x+2)(4x-3) = 0$

$x+2=0$ $\quad x=-2$ $\quad 4x-3=0$

$4x=3$

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

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



y-intercept $(0,-6)$

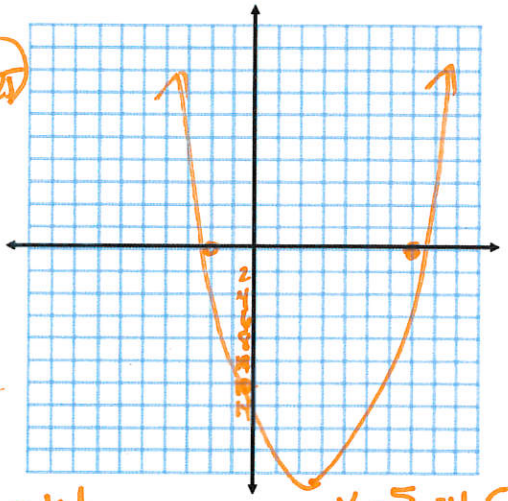
$\frac{-b}{2a}$ $\frac{-5}{2(4)} = \frac{-5}{8}$

$4(-\frac{5}{8})^2 + 5(-\frac{5}{8}) - 6$

vertex $(-\frac{5}{8}, -7.5625)$

Solve by completing the square. Identify the vertex, axis of symmetry, and find the zeroes. Then graph.

8.) $\frac{2x^2 - 10x - 20 = 8}{2}$ $x^2 - 5x - 10 = 4$



$\frac{-b}{2a} = \frac{5}{2}$

(2.5, -20.5)

$\left(\frac{b}{2}\right)^2$ $\left(\frac{-5}{2}\right)^2$

$x^2 - 5x = 14$

$x^2 - 5x + 6.25 = 20.25$

$\sqrt{(x - \frac{5}{2})^2} = \sqrt{20.25}$

$x - \frac{5}{2} = \pm 4.5$

$x - \frac{5}{2} = 4.5$ $x = 7$

$x - \frac{5}{2} = -4.5$ $x = -2$

9.) $x^2 + 9x + 20 = 0$

$\left(\frac{b}{2}\right)^2$ $x^2 + 9x = -20$

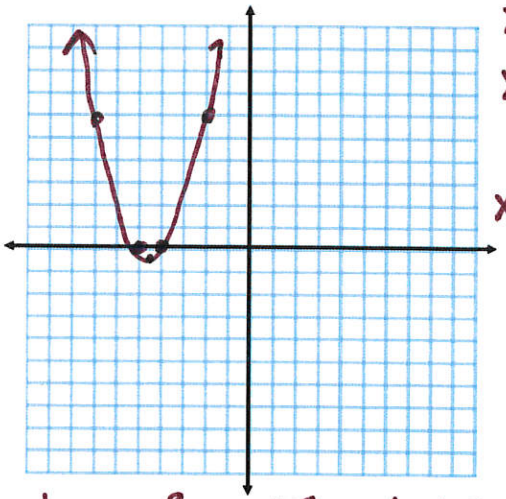
$x^2 + 9x + 20.25 = .25$

$\sqrt{(x+4.5)^2} = \sqrt{.25}$

$x + 4.5 = \pm .5$

$x + 4.5 = .5$ $x = -4$

$x + 4.5 = -.5$ $x = -5$



$\frac{-b}{2a} = \frac{-9}{2} = -4.5$ $(-4.5, -\frac{1}{4})$

x	-2
y	6

10.) $x^2 - 8x = -12$

$\left(\frac{b}{2}\right)^2$ $\left(\frac{8}{2}\right)^2 = 16$

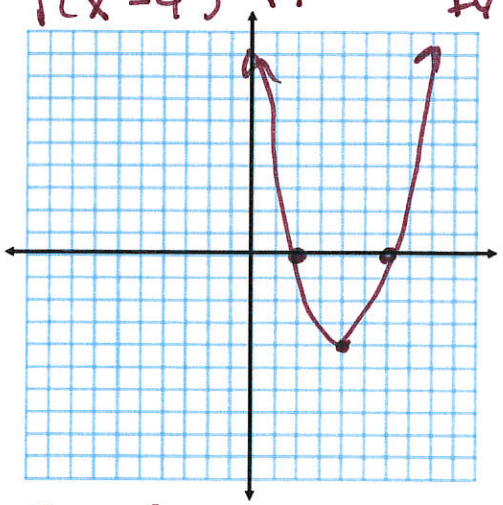
$x^2 - 8x + 16 = 4$

$\sqrt{(x-4)^2} = \sqrt{4}$

$x - 4 = \pm 2$

$x - 4 = 2$ $x = 6$

$x - 4 = -2$ $x = 2$



$\frac{-b}{2a} = \frac{8}{2(1)} = \frac{8}{2} = 4$

(4, -4)

11.) $y = x^2 + 7x + 12$

$-12 = x^2 + 7x$

$\left(\frac{b}{2}\right)^2$ $\left(\frac{7}{2}\right)^2$

$0.25 = x^2 + 7x + 12.25$

$= 12.25$

$\sqrt{0.25} = \sqrt{(x+3.5)^2}$

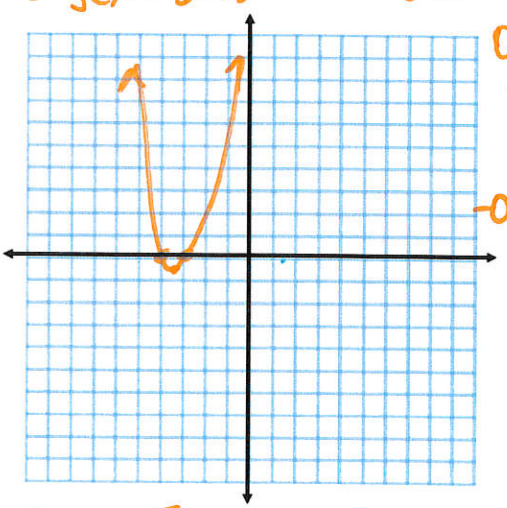
$\pm 0.5 = x + 3.5$

$0.5 = x + 3.5$

$x = -3$

$-0.5 = x + 3.5$

$x = -4$



$\frac{-b}{2a}$ $\frac{-7}{2(1)} = -3.5$

(-3.5, -0.25)