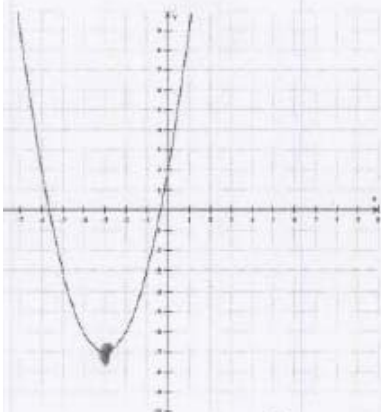


11.1 PRACTICE SOLUTIONS

#1
 $y = x^2 + 6x + 2$



x	y
-6	2
-5	-3
-4	-6
-3	-5
-2	-6
-1	-3
0	2

$$y = (-6)^2 + 6(-6) + 2 = 36 - 36 + 2 = 2$$

$$y = (-5)^2 + 6(-5) + 2 = 25 - 30 + 2 = -3$$

$$y = (-4)^2 + 6(-4) + 2 = 16 - 24 + 2 = -6$$

$$y = (-3)^2 + 6(-3) + 2 = 9 - 18 + 2 = -5$$

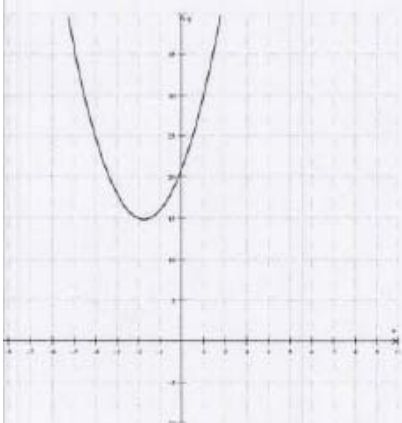
$$y = (-2)^2 + 6(-2) + 2 = 4 - 12 + 2 = -6$$

$$y = (-1)^2 + 6(-1) + 2 = 1 - 6 + 2 = -3$$

$$y = (0)^2 + 6(0) + 2 = 0 + 0 + 2 = 2$$

axis of symmetry $x = \frac{-6}{2(1)} = \frac{-6}{2} = -3$ Vertex $(-3, -5)$

#2
 $y = 2x^2 + 7x + 21$



x	y
-5	36
-4	25
-3	18
-2	15
-1	16
0	21

$$y = 2(-5)^2 + 7(-5) + 21 = 50 - 35 + 21 = 36$$

$$y = 2(-4)^2 + 7(-4) + 21 = 32 - 28 + 21 = 25$$

$$y = 2(-3)^2 + 7(-3) + 21 = 18 - 21 + 21 = 18$$

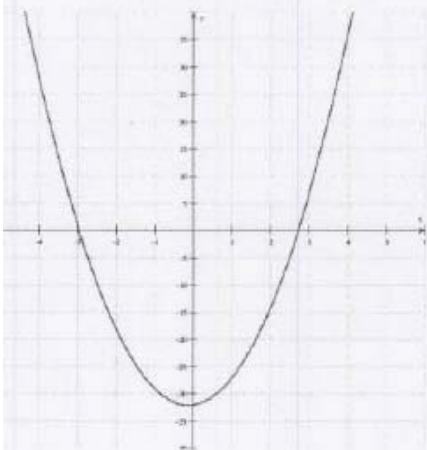
$$y = 2(-2)^2 + 7(-2) + 21 = 8 - 14 + 21 = 15$$

$$y = 2(-1)^2 + 7(-1) + 21 = 2 - 7 + 21 = 16$$

$$y = 2(0)^2 + 7(0) + 21 = 0 + 0 + 21 = 21$$

axis of symmetry $x = \frac{-7}{2(2)} = \frac{-7}{4}$ Vertex $(-\frac{7}{4}, 14.875)$
 $y = 2(-\frac{7}{4})^2 + 7(-\frac{7}{4}) + 21 = 14.875$

#3
 $y = 4x^2 + x - 32$



x	y
-3	1
-2	-18
-1	-29
0	-32
1	-27
2	-14
3	7

$$y = 4(-3)^2 + (-3) - 32 = 36 - 3 - 32 = 1$$

$$y = 4(-2)^2 + (-2) - 32 = 16 - 2 - 32 = -18$$

$$y = 4(-1)^2 + (-1) - 32 = 4 - 1 - 32 = -29$$

$$y = 4(0)^2 + (0) - 32 = 0 + 0 - 32 = -32$$

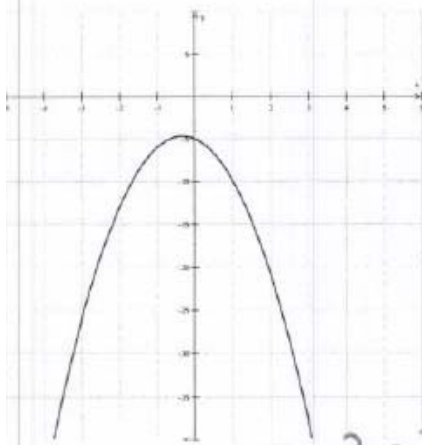
$$y = 4(1)^2 + (1) - 32 = 4 + 1 - 32 = -27$$

$$y = 4(2)^2 + (2) - 32 = 16 + 2 - 32 = -14$$

$$y = 4(3)^2 + (3) - 32 = 36 + 3 - 32 = 7$$

axis of symmetry $x = \frac{-1}{2(4)} = \frac{-1}{8}$ Vertex $(-\frac{1}{8}, -32.0625)$
 $y = 4(-\frac{1}{8})^2 + (-\frac{1}{8}) - 32 = -32.0625$

#4
 $y = -3x^2 - 2x - 5$

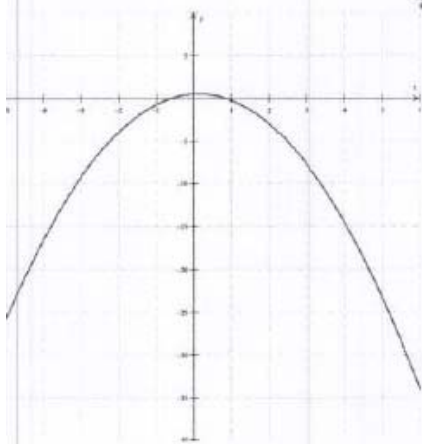


x	y
-3	-26
-2	-13
-1	-6
0	-5
1	-10
2	-21
3	-38

$y = -3(-3)^2 - 2(-3) - 5 = -27 + 6 - 5 = -26$
 $y = -3(-2)^2 - 2(-2) - 5 = -12 + 4 - 5 = -13$
 $y = -3(-1)^2 - 2(-1) - 5 = -3 + 2 - 5 = -6$
 $y = -3(0)^2 - 2(0) - 5 = 0 - 0 - 5 = -5$
 $y = -3(1)^2 - 2(1) - 5 = -3 - 2 - 5 = -10$
 $y = -3(2)^2 - 2(2) - 5 = -12 - 4 - 5 = -21$
 $y = -3(3)^2 - 2(3) - 5 = -27 - 6 - 5 = -38$

is of symmetry $x = \frac{-2}{2(-3)} = \frac{2}{-6} = -\frac{1}{3}$ Vertex $y = -3(-\frac{1}{3})^2 - 2(-\frac{1}{3}) - 5 = -4.6$
 $(-\frac{1}{3}, -4.6)$

#5
 $y = -x^2 + \frac{1}{4}x + \frac{1}{2}$



~~Points~~ points

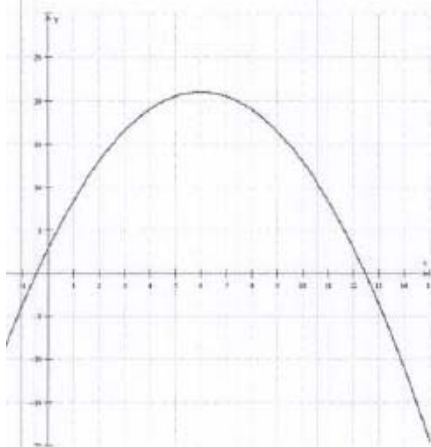
x	y
-3	-9.25
-2	-4
-1	-0.75
0	0.5
1	-0.25
2	-3

$y = -(-3)^2 + \frac{1}{4}(-3) + \frac{1}{2} = -9 - 0.75 + 0.5 = -9.25$
 $y = -(-2)^2 + \frac{1}{4}(-2) + \frac{1}{2} = -4 - 0.5 + 0.5 = -4$
 $y = -(-1)^2 + \frac{1}{4}(-1) + \frac{1}{2} = -1 - 0.25 + 0.5 = -0.75$
 $y = -(0)^2 + \frac{1}{4}(0) + \frac{1}{2} = 0 + 0 + \frac{1}{2} = 0.5$
 $y = -(1)^2 + \frac{1}{4}(1) + \frac{1}{2} = -1 + 0.25 + 0.5 = -0.25$
 $y = -(2)^2 + \frac{1}{4}(2) + \frac{1}{2} = -4 + 0.5 + 0.5 = -3$

$(0.125, 0.453125)$

is of symmetry $x = \frac{-\frac{1}{4}}{2(-1)} = 0.125$ Vertex $y = -(0.125)^2 + \frac{1}{4}(0.125) + \frac{1}{2} = 0.515625$ or $\frac{33}{64}$

#6
 $y = -\frac{1}{2}x^2 + 6x + 3$



x	y
0	3
2	13
4	19
6	21
8	19
10	13

$y = -\frac{1}{2}(0)^2 + 6(0) + 3 = 0 + 0 + 3 = 3$
 $y = -\frac{1}{2}(2)^2 + 6(2) + 3 = -2 + 12 + 3 = 13$
 $y = -\frac{1}{2}(4)^2 + 6(4) + 3 = -8 + 24 + 3 = 19$
 $y = -\frac{1}{2}(6)^2 + 6(6) + 3 = -18 + 36 + 3 = 21$
 $y = -\frac{1}{2}(8)^2 + 6(8) + 3 = -32 + 48 + 3 = 19$
 $y = -\frac{1}{2}(10)^2 + 6(10) + 3 = -50 + 60 + 3 = 13$

$(6, 21)$

is of symmetry $x = \frac{-6}{2(-\frac{1}{2})} = \frac{-6}{-1} = 6$ Vertex