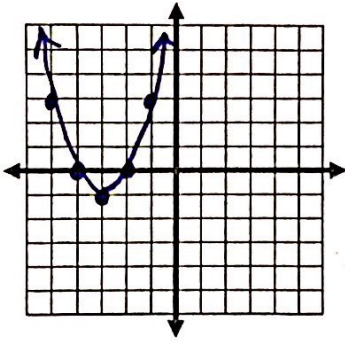


1) Graph $h(x) = x^2 + 6x + 8$



| X | Y |
|----|----|
| -5 | 3 |
| -4 | 0 |
| -3 | -1 |
| -2 | 0 |
| -1 | 3 |

2) What is the vertex & AOS?

V: (-3, -1) AOS: $x = -3$

$$x = \frac{-b}{2a} = -3 \quad y = (-3)^2 + 6(-3) + 8$$

$$y = -1$$

3) What are the domain and range?

D: $(-\infty, \infty)$ R: $[-1, \infty)$

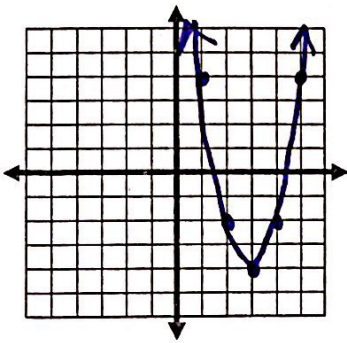
4) What are the x-intercepts?

$(-4, 0)$ $(-2, 0)$

5) What is the y-intercept?

$(0, 8)$

6) Graph $f(x) = 2(x - 3)^2 - 4$



| X | Y |
|---|----|
| 1 | 4 |
| 2 | -2 |
| 3 | -4 |
| 4 | -2 |
| 5 | 4 |

7) What is the vertex & AOS?

V: (3, -4)
AOS: $x = 3$

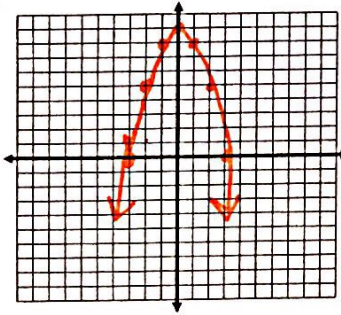
8) What is the domain and range?

D: $(-\infty, \infty)$
R: $[-4, \infty)$

9) What is the y-intercept for this function?

$(0, 14)$

10) Graph $r(x) = -x^2 + 9$



| X | Y |
|----|---|
| -2 | 5 |
| -1 | 8 |
| 0 | 9 |
| 1 | 8 |
| 2 | 5 |

11) Domain: $(-\infty, \infty)$

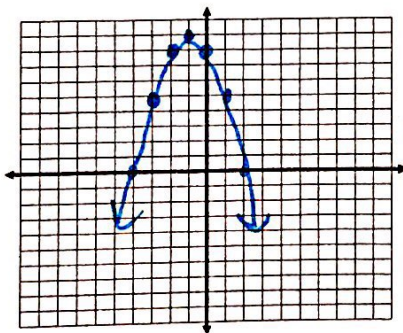
12) Range: $(-\infty, 9]$

13) Vertex: $(0, 9)$ 14) Axis of Symmetry: $x = 0$

15) x-intercepts: $(3, 0)$ $(-3, 0)$

16) y-intercept: $(0, 9)$

17) Graph $y = -(x + 4)(x - 2)$



| X | Y |
|----|---|
| -3 | 5 |
| -2 | 8 |
| -1 | 9 |
| 0 | 8 |
| 1 | 5 |

18) Zeros: $-4, 2$

19) Vertex: $(-1, 9)$

20) Axis of Symmetry: $x = -1$

21) y-intercept: $(0, 8)$

$$x = \frac{-4 + 2}{2} = -1$$

$$y = -1(-1 + 4)(-1 - 2)$$

$$y = 9$$

Directions: Name the transformations by comparing each function to $f(x) = x^2$.

22) $g(x) = 3(x-1)^2$

Stretch of 3:
Right 1

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

Reflect over x-axis
Up 4

24) $q(x) = (x-2)^2 - 5$

Right 2
Down 5

Directions: Write the equation in vertex form that has been...

25) Shifted to the right 3 units and down 8 units

$$y = (x-3)^2 - 8$$

26) Reflected over the x-axis & shrunk vertically by $\frac{1}{2}$

$$y = -\frac{1}{2}x^2$$

27) Reflected over the x-axis and shifted left 9 units

$$y = -(x+9)^2$$

28) Vertically stretched by 5 and shifted up 10 units

$$y = 5x^2 + 10$$

29) A ball is thrown upward with an initial velocity of 56 feet per second. The height, h , of the ball t seconds after it is thrown is given by the formula: $h(t) = 56t - 16t^2 \rightarrow h(t) = -16t^2 + 56t$

a) What is the height of the ball after one second?

$$h(1) = 56(1) - 16(1)^2 = \boxed{40 \text{ ft}}$$

b) How long does it take the ball to reach its maximum height?

$$t = \frac{-56}{2(-16)} = \boxed{1.75 \text{ sec}}$$

c) What is the maximum height?

$$h(t) = 56(1.75) - 16(1.75)^2 = \boxed{49 \text{ ft}}$$

d) How long does it take the ball to reach the ground?

$$0 = -16t^2 + 56t$$

$$-8t = 0$$

$$2t - 7 = 0$$

$$0 = -8t(2t - 7)$$

$$t = 0$$

$$2t = 7$$

$$t = \boxed{3.5 \text{ sec}}$$

30) A tall building in downtown Atlanta is 1250 feet tall. If an object is thrown upward from the top of this building at an initial velocity of 38 feet per second, its height s seconds after it is thrown is given by the function $h(s) = -16s^2 + 38s + 1250$. How long will it take for the object thrown to hit the ground?

$$0 = -16s^2 + 38s + 1250$$

$$s = \frac{-38 \pm \sqrt{(38)^2 - 4(-16)(1250)}}{2(-16)}$$

$$s = \frac{-38 \pm \sqrt{81444}}{-32}$$

$$s = \cancel{-7.73}, \boxed{10.1 \text{ sec}}$$