Intermediate Algebra
Unit 4 Review (4.1-4.2)

Name_____
Period___Date_____

4.1 ***I can graph quadratic functions and demonstrate understanding of significant features of different forms of quadratic and their real-world situations.***

Level 1

Find the vertex of each quadratic function and state whether it is a maximum or minimum.

1. $y = 3x^2 - 18x + 5$

$x = \frac{-b}{2a} = \frac{18}{2(3)} = \frac{18}{6} = 3$

$y = 3(3)^2 - 18(3) + 5 = -22$

$(3, -22)$

2. $y = -3(x+6)(x-2)$

$x = \frac{r+s}{2} = \frac{-6+2}{2} = \frac{-4}{2}$ $x = -2$

$(-2, 48)$

3. $y = 2(x+8)(x+2)$

$x = \frac{r+s}{2} = \frac{-8+-2}{2} = \frac{-10}{2} = -5$

$(-5, -18)$

4. $y = (x+4)^2 - 12$

(opp h, k)

$(-4, -12)$

5. $y = -x^2 - 6x + 20$

$x = \frac{-b}{2a} = \frac{6}{2(-1)} = \frac{6}{-2} = -3$

$y = -(-3)^2 - 6(-3) + 20 = 29$

$(-3, 29)$

6. $y = -3(x-5)^2 - 15$

(opp h, k)

$(5, -15)$

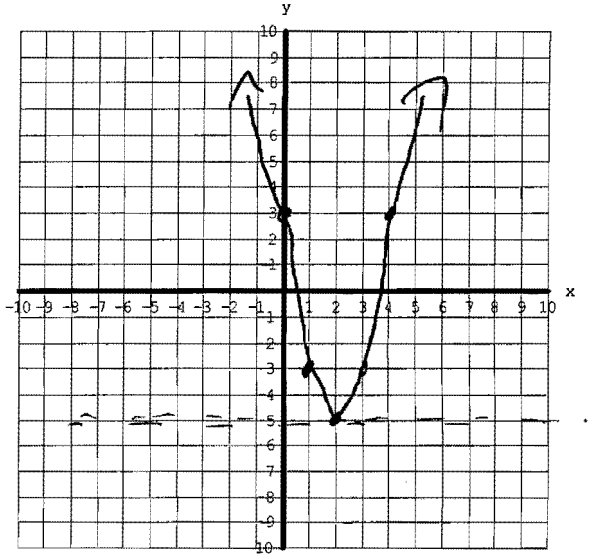
Graph each function. State the vertex (min/max), axis of symmetry, domain, and range.

7. $y = 2x^2 - 8x + 3$

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

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

x	y



Vertex: $2, -5$ Max or (min)?

Axis of symmetry: $x = 2$

y-intercept: 3

Domain: $\mathbb{R}$'s

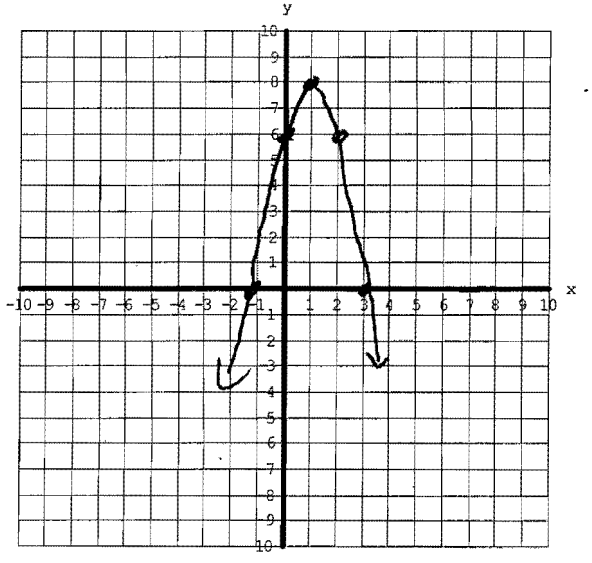
Range: $y \geq -5$

8. $y = -2(x-3)(x+1)$

$x = \frac{r+s}{2} = \frac{3+-1}{2} = \frac{2}{2} = 1$

$y = 8$

x	y



Vertex: $(1, 8)$ (Max) or min?

Axis of symmetry: $x = 1$

x – intercepts: $3, -1$

Domain: $\mathbb{R}$'s

Range: $y \leq 8$

9. $y = -\frac{1}{2}(x+5)^2 + 8$

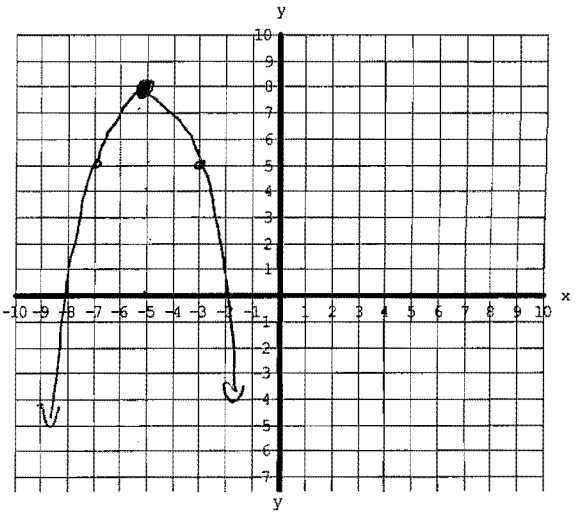
Vertex: $-5, 8$ Max or min?

Axis of symmetry: $x = -5$

Domain: $\mathbb{R}$'s

Range: $y \leq 8$

x	y



10. $y = -2x^2 + 1$

Vertex: $0, 1$ Max or min?

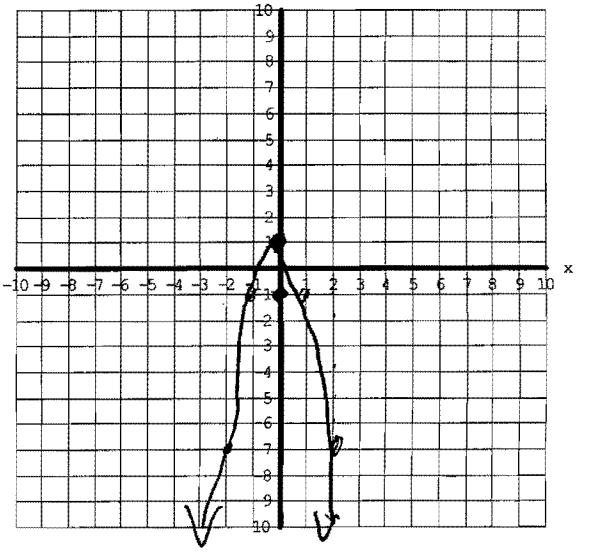
Axis of symmetry: $x = 0$

y – intercept: $x = 1$

Domain: $\mathbb{R}$'s

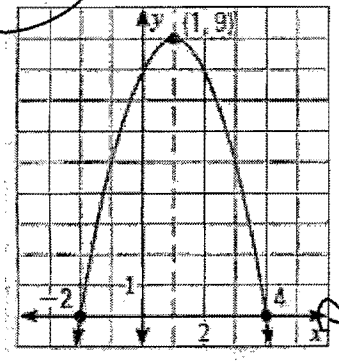
Range: $y \leq 1$

x	y

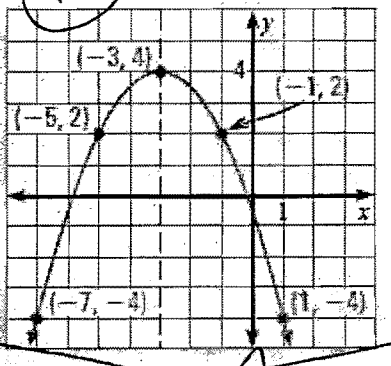


Match each graph with its equation

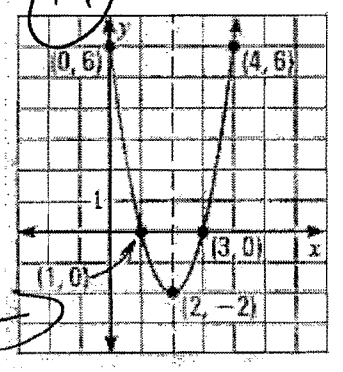
11. C



12. B



13. A



A. $y = 2x^2 - 8x + 6$

$x = \frac{8}{2(2)} = \frac{8}{4} = 2$

$(2, -2)$

B. $y = -\frac{1}{2}(x+3)^2 + 4$

$(-3, 4)$

C. $y = -(x+2)(x-4)$

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

$(1, 9)$

Level 2/3

The height in feet of a football that is kicked can be modeled by the function $y = -10x^2 + 28x$, where x is the ne in seconds after kicked. Find the football's maximum height and the time it takes the ball to reach this height

A) What is the maximum height? (find vertex)

$a = -10$
$b = 28$
$c = 0$

$x = \frac{-b}{2a} = \frac{-28}{2(-10)} = \frac{-28}{-20} = 1.4$

$y = -10(1.4)^2 + 28(1.4) = 19.6$

19.6 ft

B) How long does it take to reach this height?

1.4 sec

C) How long is the ball in the air?

about 3 sec

25. Draw a graph with the following features:

A) $a < 0$

B) x-intercepts= (4,0) and (-2,0)