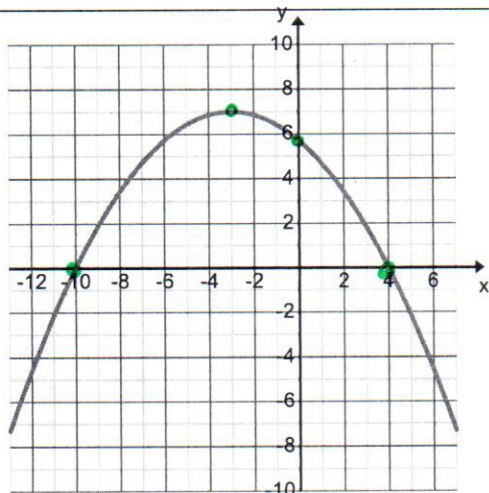


Identify the key features from the graph.

1.

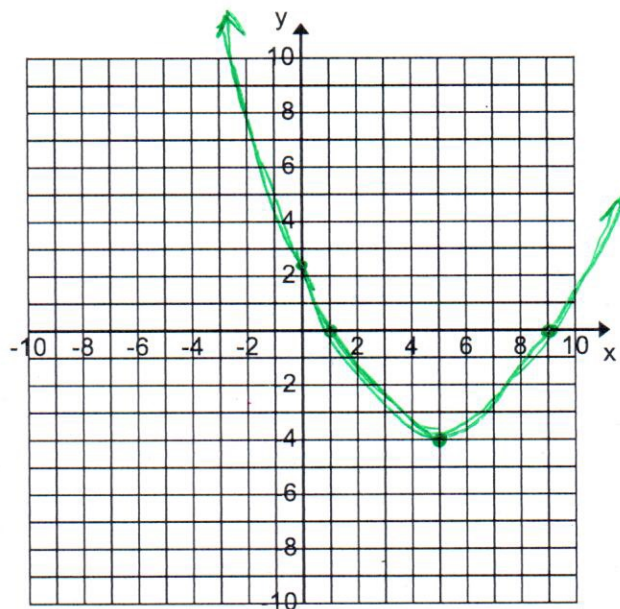


Vertex: Max@ (-3, 7)	Axis of Symmetry: X = -3
y-intercept: (0, 6)	x-intercepts: (-10, 0) (4, 0)
Domain: (-∞, ∞)	Range: (-∞, 7]
Is the vertex a maximum or a minimum? Maximum	

2. $y = .25(x - 1)(x - 9)$

Form: <u>intercept form</u>	
Vertex: <u>Min@ (5, -4)</u>	Axis of Symmetry: <u>X = 5</u>
y-intercept: <u>(0, 2.25)</u>	x-intercepts: <u>(1, 0) (9, 0)</u>
Domain: <u>(-∞, ∞)</u>	Range: <u>[-4, ∞)</u>

$h = \frac{1+9}{2} = 5$
 $k = 0.25(5-1)(5-9) = -4$
 $y = 0.25(0-1)(0-9) = 2.25$

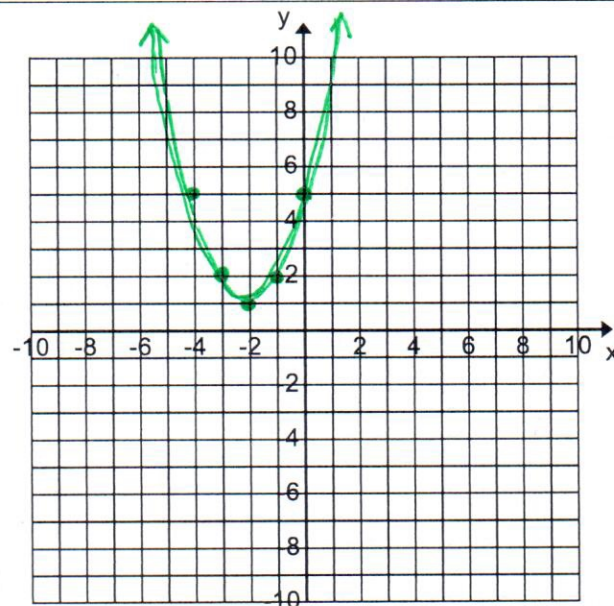


3. $y = (x + 2)^2 + 1$

Form: <u>vertex form</u>	
Vertex: <u>Min@ (-2, 1)</u>	Axis of Symmetry: <u>X = -2</u>
y-intercept: <u>(0, 5)</u>	x-intercepts: <u>NONE</u>
Domain: <u>(-∞, ∞)</u>	Range: <u>[1, ∞)</u>

$y = (0+2)^2 + 1 = 5$

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

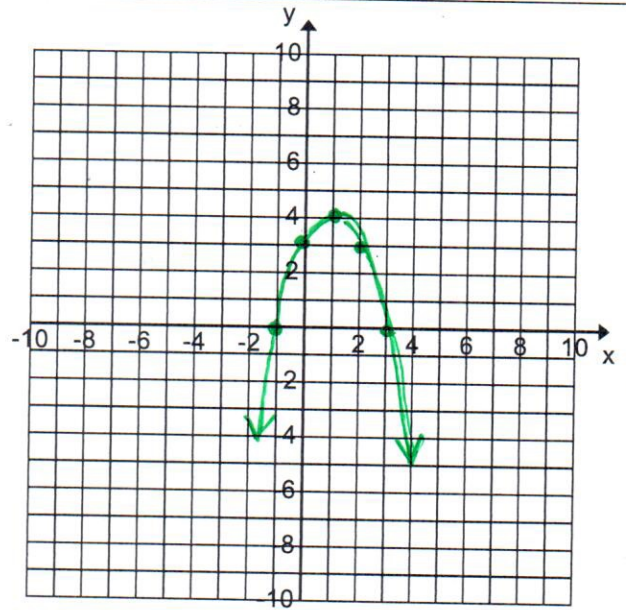


$$4. y = -(x - 1)^2 + 4$$

Form: vertex form	
Vertex: Max@ (1, +4)	Axis of Symmetry: x=1
y-intercept: (0, 3)	x-intercepts: (-1, 0) (3, 0)
Domain: $(-\infty, \infty)$	Range: $(-\infty, +4]$

$$y = -(0-1)^2 + 4 = 3$$

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

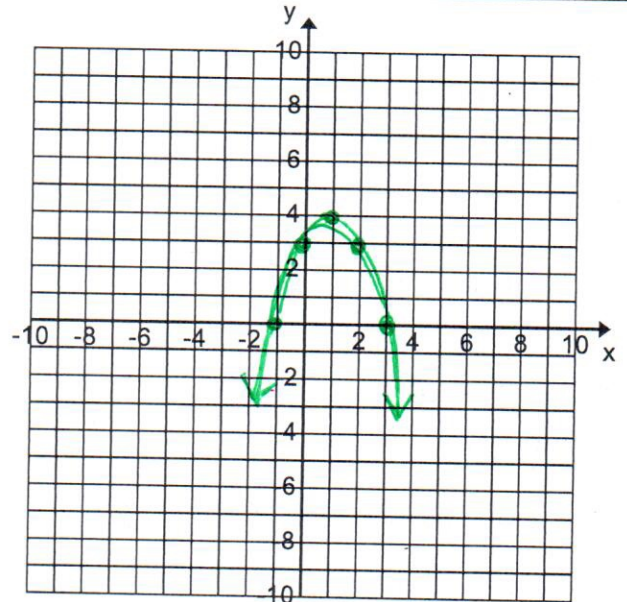


$$5. y = -x^2 + 2x + 3$$

Form: standard form	
Vertex: Max@ (1, 4)	Axis of Symmetry: x=1
y-intercept: (0, 3)	x-intercepts: (-1, 0) (3, 0)
Domain: $(-\infty, \infty)$	Range: $(-\infty, 4]$

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

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

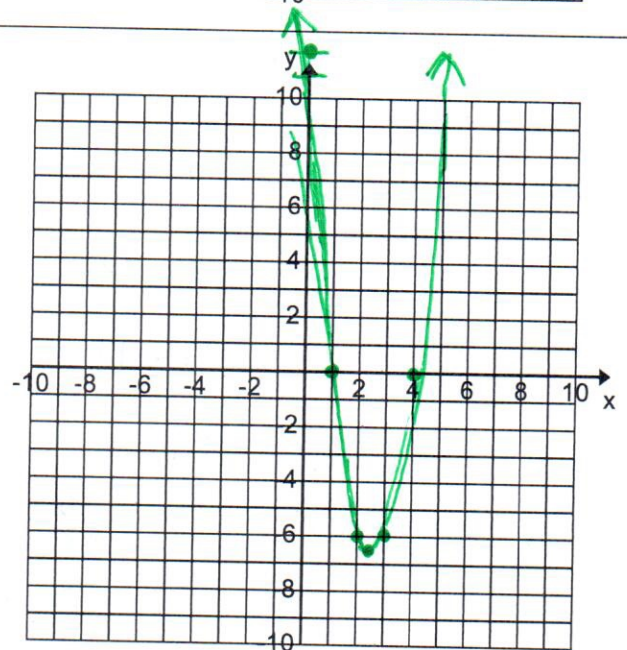


$$6. y = 3(x - 4)(x - 1)$$

Form: intercept form	
Vertex: Min@ (2.5, -6.8)	Axis of Symmetry: x=2.5
y-intercept: (0, 12)	x-intercepts: (4, 0) (1, 0)
Domain: $(-\infty, \infty)$	Range: $[-6.8, \infty)$

$$h = \frac{4+1}{2} = 2.5$$

x	y
1	0
2.5	-6.8
3	-6
4	0
0	12



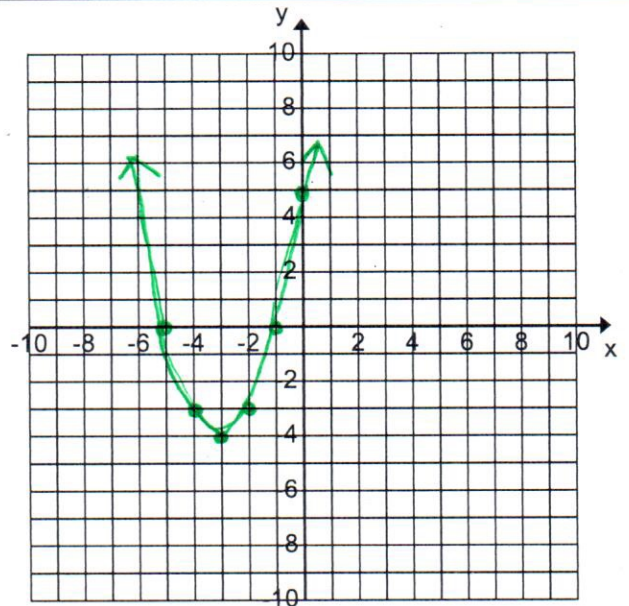
* SAME PROBLEM -
 DIFFERENT FORMS! *

$$7. y = x^2 + 6x + 5$$

Form: standard form	
Vertex: Min@ $(-3, -4)$	Axis of Symmetry: $X = -3$
y-intercept: $(0, 5)$	x-intercepts: $(-1, 0)$ $(-5, 0)$
Domain: $(-\infty, \infty)$	Range: $[-4, \infty)$

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

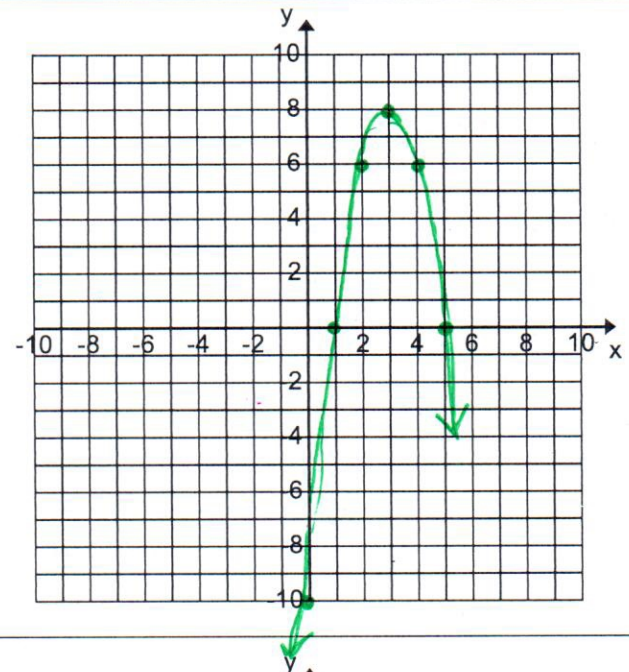
x	y
-1	0
-2	-3
-3	-4
-4	-3
-5	0
0	5



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

Form: vertex form	
Vertex: Max@ $(3, 8)$	Axis of Symmetry: $X = 3$
y-intercept: $(0, -10)$	x-intercepts: $(1, 0)$ $(5, 0)$
Domain: $(-\infty, \infty)$	Range: $(-\infty, 8]$

x	y
1	0
2	6
3	8
4	6
5	0
0	-10

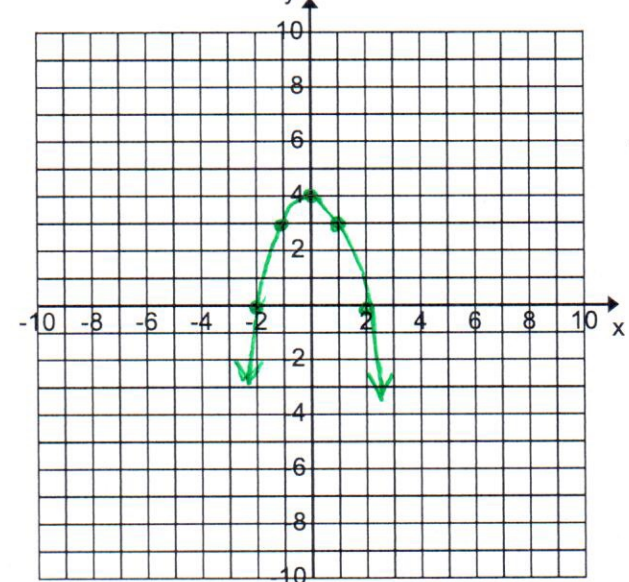


$$9. y = -(x - 2)(x + 2)$$

Form: intercept form	
Vertex: Max@ $(0, 4)$	Axis of Symmetry: $X = 0$
y-intercept: $(0, 4)$	x-intercepts: $(2, 0)$ $(-2, 0)$
Domain: $(-\infty, \infty)$	Range: $(-\infty, 4]$

$$h = \frac{p+q}{2} = \frac{2-2}{2} = 0$$

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

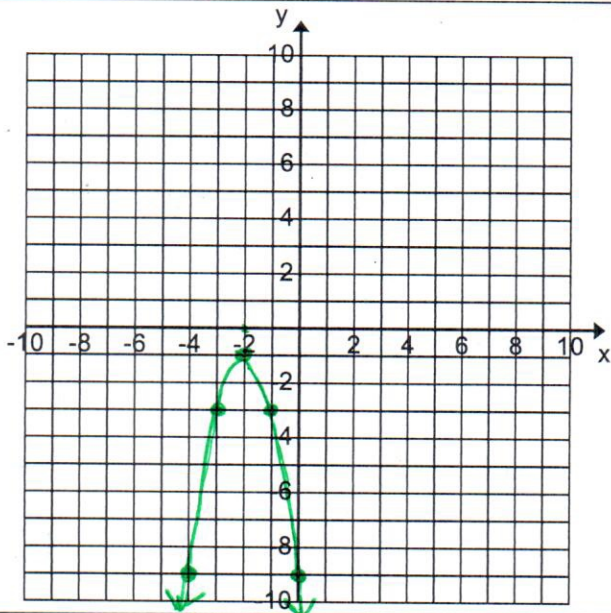


10. $y = -2x^2 - 8x - 9$

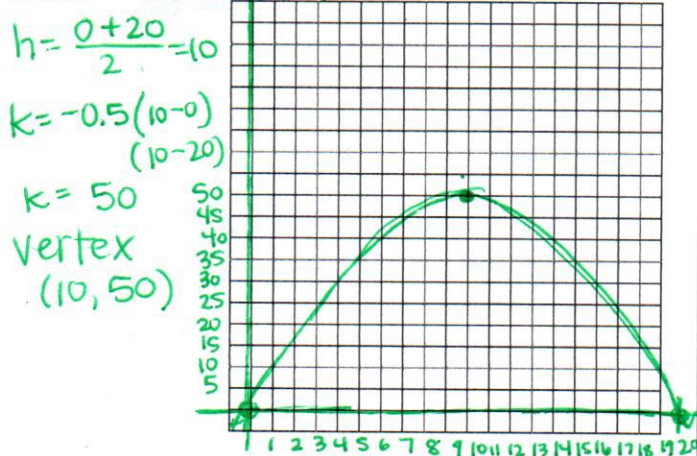
Form: standard form	
Vertex: Max@ (-2, -1)	Axis of Symmetry: $x = -2$
y-intercept: (0, -9)	x-intercepts: NONE
Domain: $(-\infty, \infty)$	Range: $(-\infty, -1]$

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

x	y
0	-9
-1	-3
-2	-1
-3	-3
-4	-9



11. A baseball is thrown across a field. Its trajectory is modeled by a parabola that has the equation $y = -0.5(x-0)(x-20)$, where x and y are measured in feet. **intercept form**



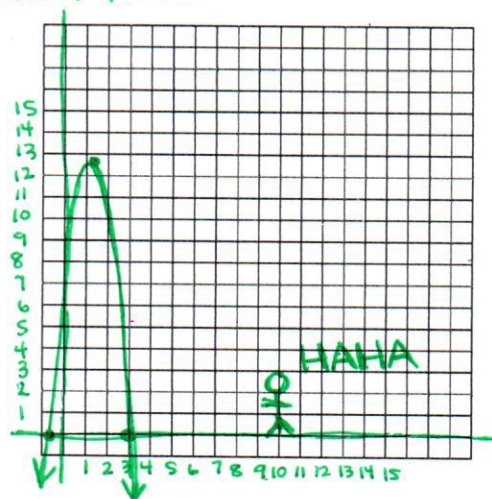
a) How far did the ball travel horizontally by the time it hit the ground?

x-intercepts
 $x-0=0$ $x-20=0$
 $x=0$ **$x=20$ ft**

b) What was the maximum height of the ball?

vertex
(10, 50)
50 feet high

12. Katniss shoots an arrow that follows the equation $y = -5x^2 + 14x + 3$, where x and y are measured in feet. **standard form**



a) What was the maximum height of her arrow?

vertex
 $h = \frac{-b}{2a} = \frac{-14}{2(-5)} = \frac{+14}{-10} = 1.4$
 $y = -5(1.4)^2 + 14(1.4) + 3 = 12.8$
12.8 ft

b) Could she possibly hit a person standing 10 feet away with this arrow?

x-intercepts
 $0 = -5x^2 + 14x + 3$ $\frac{9c}{-15}$
 $0 = -5x^2 - 1x + 15x + 3$ $-1, 15$
 $0 = -x(5x+1) + 3(5x+1)$
 $0 = (5x+1)(-x+3)$
 $5x+1=0$ $-x+3=0$
 $x = -1/5$ $x = 3$

NO!