

+ Warm Up

- 1) Given $f(x) = x^2 - 7x + 6$, state the following:
 - 1) Vertex:
 - 2) AOS:
 - 3) Max or Min Value:
 - 4) Y-Intercept:
 - 5) X-Intercepts:

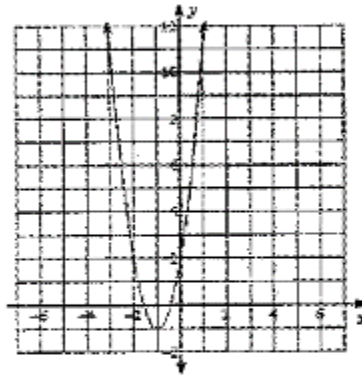




Homework Answers 1-4

I. For each graph fill in the blanks for the requested information.

a) $y = 3x^2 + 6x + 2$



Vertex: $(-1, -1)$

Zeros: $(-1.58, 0)$ + $(-0.423, 0)$

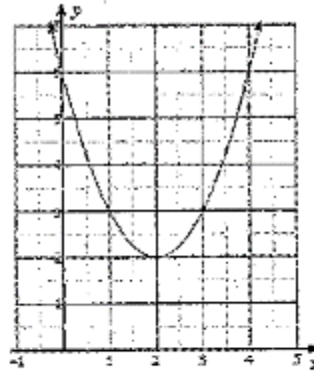
y-intercept: $(0, 2)$

Axis of symmetry: $x = -1$

Decreasing interval: $x < -1$

Increasing interval: $x > -1$

b) $y = x^2 - 4x + 6$



Vertex: $(2, 2)$

Zeros: No real zeros

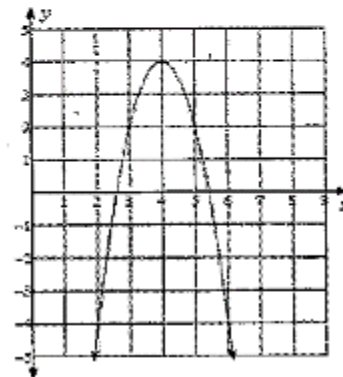
y-intercept: $(0, 6)$

Axis of symmetry: $x = 2$

Decreasing interval: $x < 2$

Increasing interval: $x > 2$

c) $y = -2x^2 + 16x - 28$



Vertex: $(4, 4)$

Zeros: $(5.41, 0)$ + $(2.59, 0)$

y-intercept: $(0, -28)$

Axis of symmetry: $x = 4$

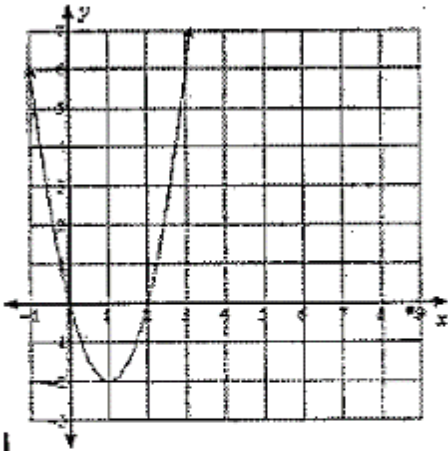
Decreasing interval: $x > 4$

Increasing interval: $x < 4$

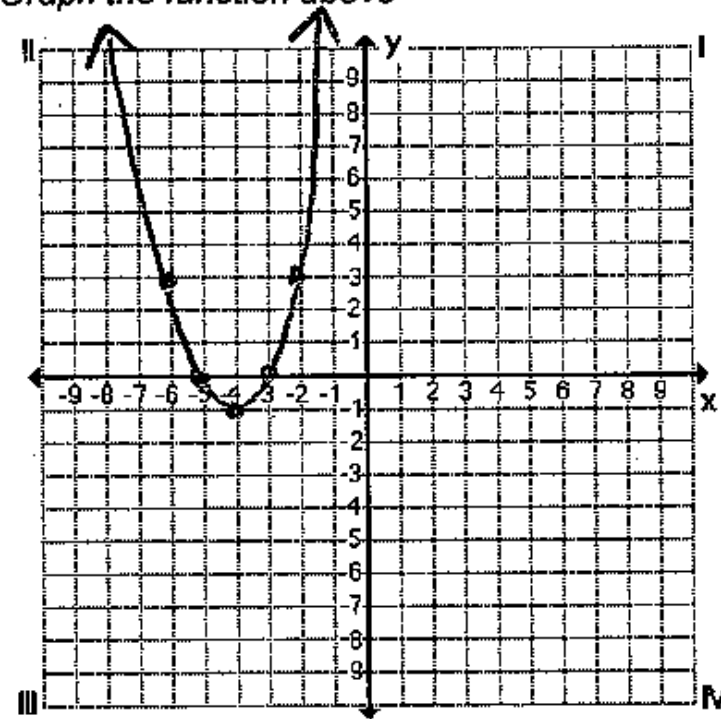
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d)

$$y = 2x^2 - 4x$$

Vertex: (1, -2)Zeroes: (0, 0) + (2, 0)y-intercept: (0, 0)Axis of symmetry: x = 1Decreasing interval: x < 1Increasing interval: x > 1

Graph the function above



ii.

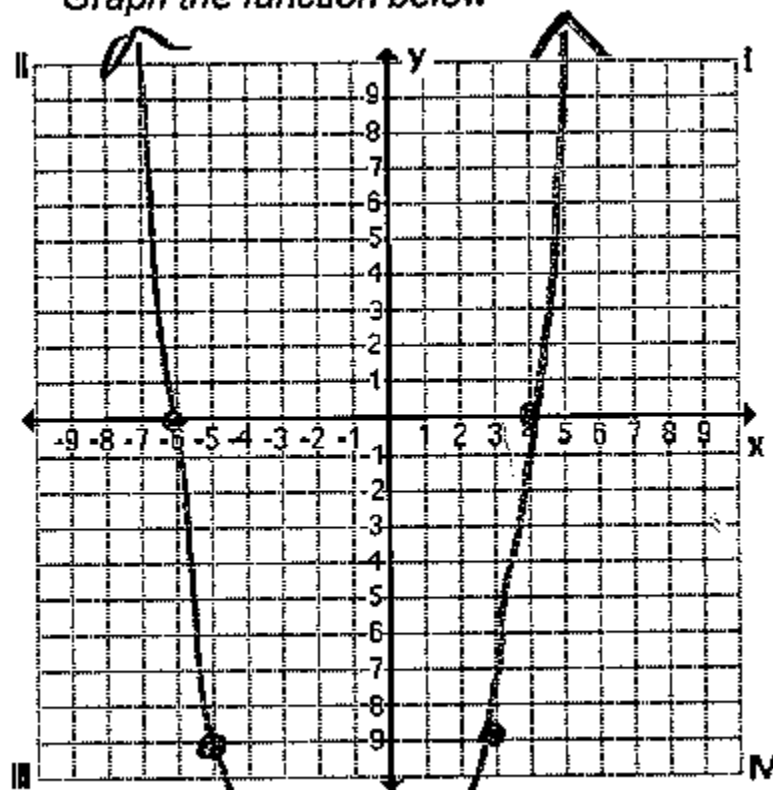
| Equation | Axis of Symmetry | Vertex | Factor | x-intercept | y-intercept |
|---------------------|--|--|--------------|------------------------|-------------|
| $y = x^2 + 8x + 15$ | $-\frac{b}{2a} = -\frac{8}{2(1)} = -\frac{8}{2}$ $x = -4$ | $(-4)^2 + 8(-4) + 15 = -1$ $(-4, -1)$ | $(x+5)(x+3)$ | $(-3, 0)$ $(-5, 0)$ | $(0, 15)$ |

Homework Answers 1-4

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Homework Answers 4-1

Graph the function below



Equation

Axis of Symmetry

Vertex

Factor

x-intercept

y-intercept

$$y = x^2 + 2x - 24$$

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

$$= \frac{-2}{2}$$

$$x = -1$$

$$(-1)^2 + 2(-1) - 24$$

$$(-1, -25)$$

$$(x+6)(x-4)$$

$$(-6, 0)$$

$$(4, 0)$$

$$(0, -24)$$

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■ For the equation $y = x^2 - 4x + 3$ find the:

■ 1. solution

$$(x-3)(x-1)$$
$$x=3 \quad x=1$$

2. x-intercepts

$$(3,0) \quad (1,0)$$

3. y-intercept

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

■ 4. AOS

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

$$x = 2$$

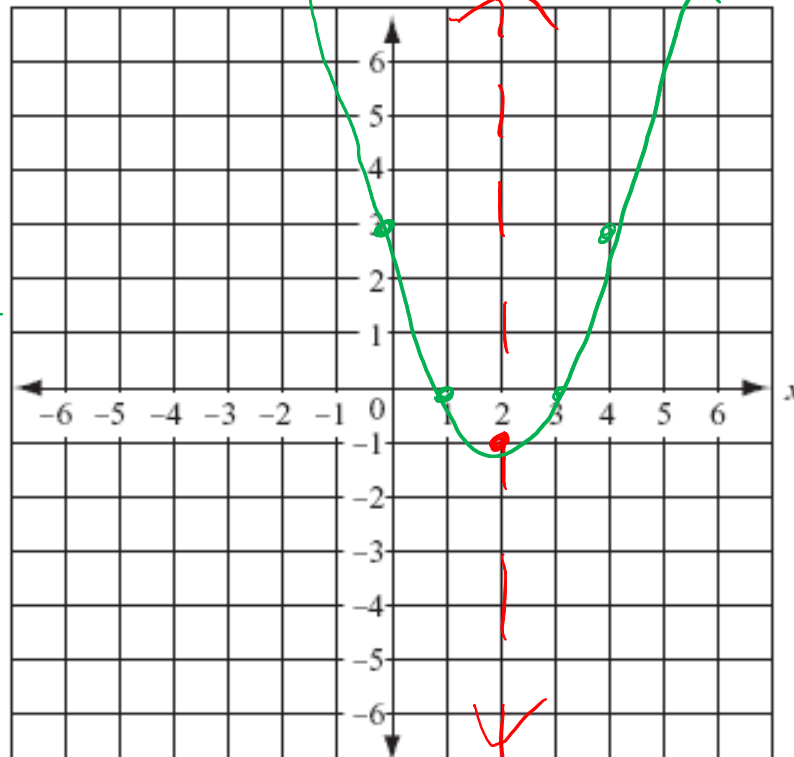
5. vertex $(2, -1)$

6. max/min

$$y = -1$$

■ 7. Graph:

| x | y |
|---|----|
| 0 | 3 |
| 1 | 0 |
| 2 | -1 |



Increasing Interval:

$$(2, \infty)$$

Decreasing Interval:

$$(-\infty, 2)$$

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■ For the equation $y = 4x^2 - 9$ find the:

■ 1. solution

$$0 = (2x+3)(2x-3) \quad y=0$$
$$x = -\frac{3}{2} \quad \frac{3}{2}$$

2. x-intercepts

$$\left(-\frac{3}{2}, 0\right) \quad \left(\frac{3}{2}, 0\right)$$

3. y-intercept

$$x=0$$
$$y = 4(0)^2 - 9$$
$$y = -9 \quad (0, -9)$$

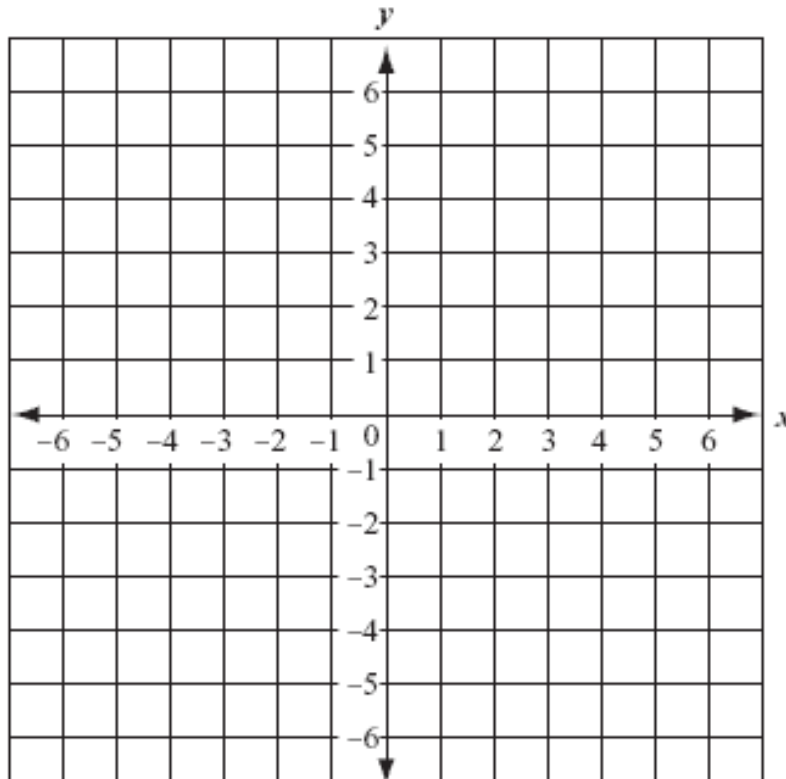
■ 4. AOS

$$x=0$$

5. vertex $(0, -9)$

6. max/min

■ 7. Graph:



Increasing Interval:

Decreasing Interval:



1) A bottlenose dolphin jumps out of the water. The path the dolphin travels can be modeled by

$h = -0.2d^2 + 2d$, where h represents the height of the dolphin and d represents the horizontal distance.

a) What is the maximum height the dolphin reached?

b) How far did the dolphin jump?





2) Jaime owns a business making decorative boxes to store jewelry, mementos, and other valuables. The function $P(x) = -x^2 + 50x + 1800$ models the profit $P(x)$ that Jaime has made in month x for the first two years of her business.

a) What was the initial start up cost of her business?

b) During what month did Jamie make the most money?

c) What was the most Jamie made?





3) A Field Hockey player makes a scoop that releases the ball with an upward velocity of 34 ft/s. The function $h = -16t^2 + 34t$ models the height h in feet of the ball at time t in seconds.

a) Does the ball ever reach 20 feet?

b) How high does the ball travel?

c) How high is the ball at 2 seconds? At 3 seconds?

d) When will the ball reach the ground?



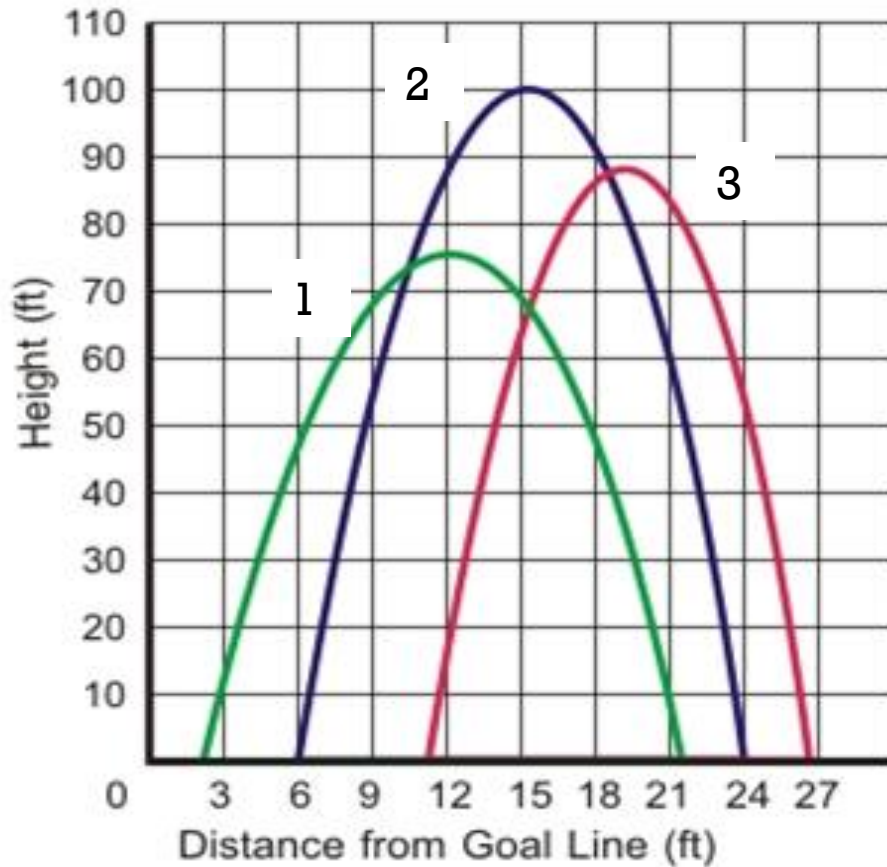


3. A toy rocket is shot upward from ground level. The table shows the height of the rocket at different times.



| Time (seconds) | 0 | 1 | 2 | 3 | 4 |
|---------------------------|----------|------------|------------|------------|------------|
| Height (feet) | 0 | 256 | 480 | 672 | 832 |

- a. Find a quadratic model for this data.
- b. Use the model to estimate the height of the rocket after 1.5 seconds.

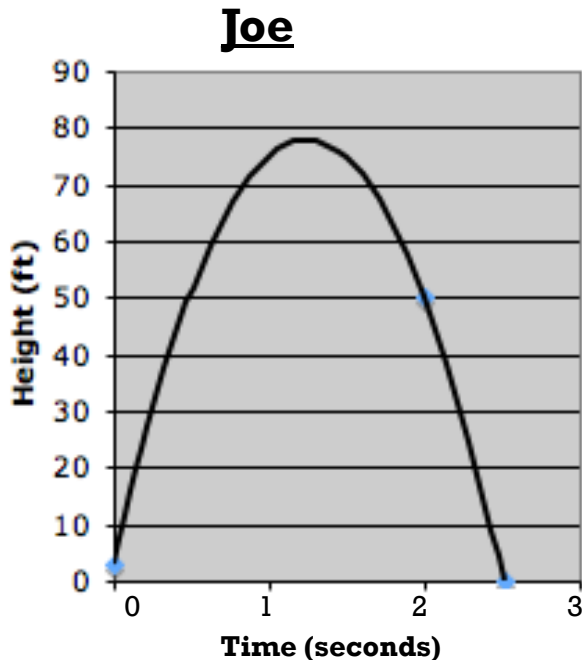


Let's ignore the questions on your paper and focus on these...

- 1) Which egg has the highest maximum? How did you figure this out?*
- 2) Which egg goes the farthest distance? How did you figure this out?*
- 3) Based on our answer for number 1, can we write an question for that graph???*

+ Putting them all together...

1) The baseball team has decided to have a throwing contest. Below is the data for 3 different players.



Michael

$$y = -16x^2 + 50x + 5$$

Henry

| Time (x) | Height (y) |
|----------|------------|
| .5 | 37.5 |
| 1 | 63 |
| 2 | 90 |
| 3 | 85 |

- Whose ball was in the air the longest?
- Who threw their ball the highest?
- If you were to determine the winner of the contest, who would you choose and why?

+Homework

HW 4-2 &
Study for
upcoming quiz!!

Tutorials: Before school and Wednesday
after school until 3:00 pm