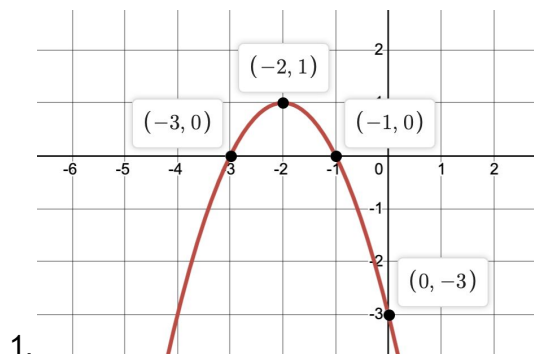


To turn in your work:

Mr. Briggs, Mr. Murnane - send a photo to email // Mrs. Burke, send a photo to email, remind, or padlet
Mrs. Dua, Mr. Dewitt, Ms. Smith, Ms. Reyburn - send a photo to email or remind

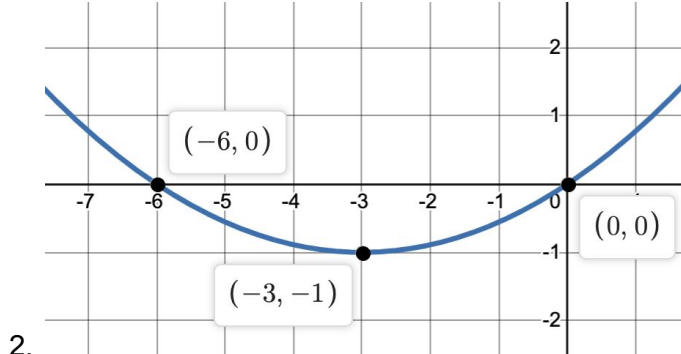
Describe the following features of the given parabolas: x-intercepts, y-intercept, vertex, axis of symmetry



x-intercepts: _____

y-intercept: _____

Vertex: _____ AOS: _____

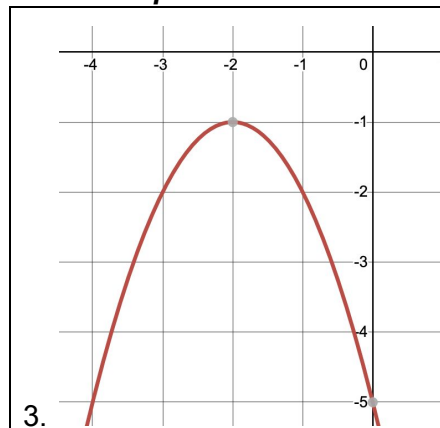


x-intercepts: _____

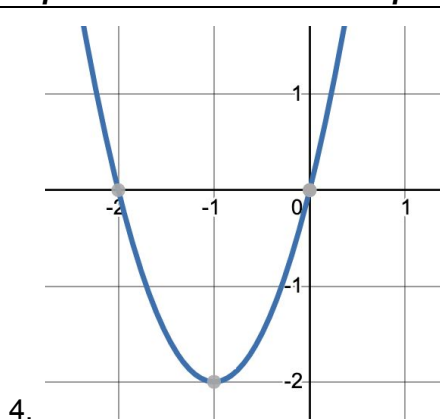
y-intercept: _____

Vertex: _____ AOS: _____

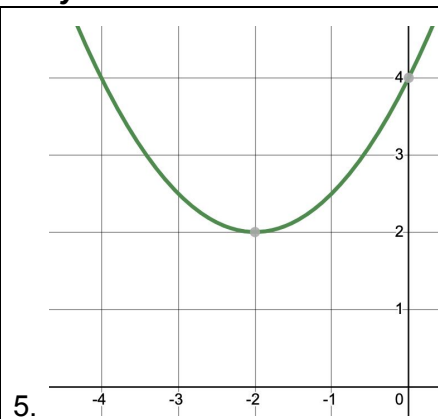
Match the parabola with the correct equation in vertex form. Explain how you know.



Matches Equation _____
Because...



Matches Equation _____
Because...



Matches Equation _____
Because...

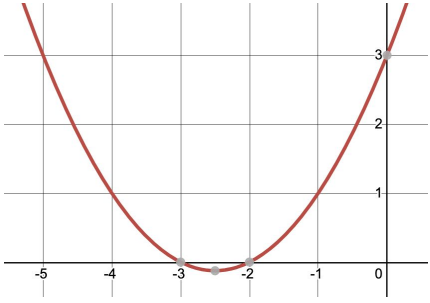
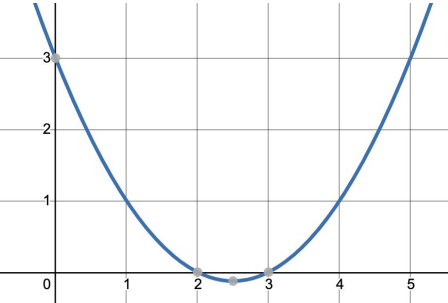
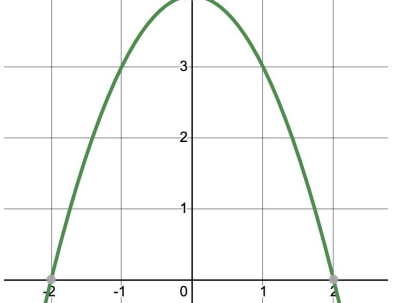
Equation A: $y = -(x + 2)^2 - 1$

Equation B: $y = -(x - 2)^2 + 2$

Equation C: $y = \frac{1}{2}(x + 2)^2 + 2$

Equation D: $y = 2(x + 1)^2 - 2$

Match the parabola with the correct equation in intercept form. Explain how you know.

6. 	7. 	8. 
Matches Equation _____ Because...	Matches Equation _____ Because...	Matches Equation _____ Because...

Equation P: $y = \frac{1}{2}(x - 2)(x - 3)$

Equation Q: $y = -(x - 2)(x + 2)$

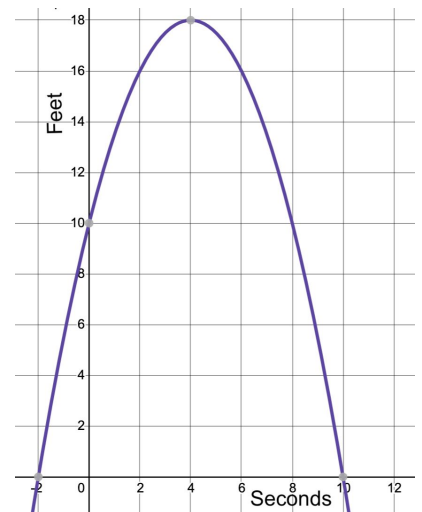
Equation R: $y = -(x + 2)^2$

Equation S: $y = \frac{1}{2}(x + 2)(x + 3)$

Answer the questions about the given situations: Explain how you know.

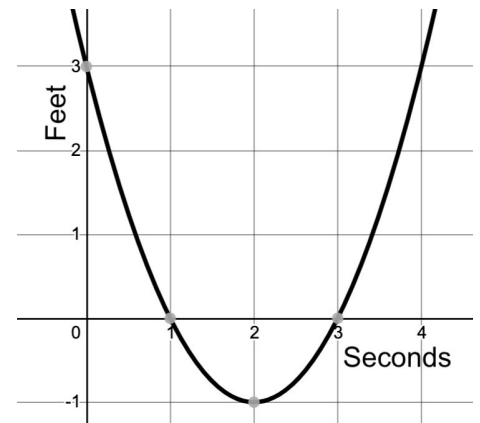
6. Dr. Amaro threw a water balloon off the roof of the MPR. The path of the balloon can be modeled by the equation $f(x) = -\frac{1}{2}(x - 4)^2 + 18$ where x is seconds after he throws the balloon and $f(x)$ is height in feet.

- What's the highest point that the water balloon reaches?
- How long does it take for the water balloon to reach the highest point?
- How long does it take for the balloon to hit the ground?



7. A penguin dives into a swimming pool. Her path can be modeled by the equation $g(x) = (x - 1)(x - 3)$, where x is seconds after she jumps and $g(x)$ is feet under water.

- How many seconds does it take for the penguin to enter the water?
- How many seconds does it take for the penguin to resurface?
- When does the penguin reach her lowest point? How low does she swim?



Solving Quadratic Equations

Algebra 1 – Distance Learning Check-In
Freedom High School

Student _____
Period _____ Teacher _____

DIRECTIONS: Complete online using [LHUSD Testing portal](#) located on the Freedom High School Website under Short Cuts, or in the Algebra 1 folder of the Online/Distance Learning Folder under math.
•• If you do NOT have internet access, print and email your paper to your work teacher turn in.

STUDENT ID: ###-####

Access Code: **TASDVGE**

For the quadratic equation below, answer the following questions.

$$x^2 - 2x + 1 = 0$$

1. Which method are you using to solve?

A) *Square Roots*

B) *Factoring & Zero Product*

C) *Completing the Square*

D) *Quadratic Formula*

2. What are the solutions or values of x ?

A) $x = \frac{1}{2}$

B) $x = -\frac{1}{2}$

C) $x = 0$

D) $x = 1$

E) $x = -1$

F) $x = 2$

G) $x = -2$

H) *No Real Solutions*

For the quadratic equation below, answer the following questions.

$$3x^2 - 5 = 22$$

3. Which method are you using to solve?

A) *Square Roots*

B) *Factoring & Zero Product*

C) *Completing the Square*

D) *Quadratic Formula*

4. What are the solutions or values of x ?

A) $x = \frac{1}{3}$

B) $x = -\frac{1}{3}$

C) $x = 0$

D) $x = 1$

E) $x = -1$

F) $x = 3$

G) $x = -3$

H) *No Real Solutions*

For the quadratic equation below, answer the following questions.

$$2x^2 - 6x + 3 = 0$$

5. Which method are you using to solve?

A) *Square Roots*

B) *Factoring & Zero Product*

C) *Completing the Square*

D) *Quadratic Formula*

6. What are the solutions or values of x ?

A) $x = \frac{2}{3}$

B) $x = -\frac{2}{3}$

C) $x = \frac{3}{2}$

D) $x = 1$

E) $x = -1$

F) $x = 3$

G) $x = -3$

H) *No Real Solutions*

Solving Quadratic Equations

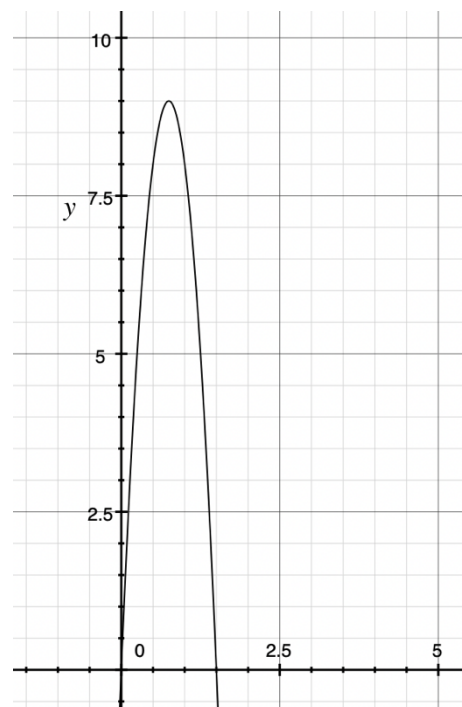
Algebra 1 – Distance Learning Check-In
Freedom High School

Student _____

Period _____ Teacher _____

7. A skier leaves the ground with an upward initial velocity of 24 feet per second. The function $h = -16t^2 + 24t$ represents the height h (in feet) of the skier in t seconds. The height of the skier at landing would be 0 feet. How long was the skier in the air?

- | | |
|------------|------------|
| A) 1.0 sec | B) 1.5 sec |
| C) 2.0 sec | D) 2.5 sec |
| E) 3.0 sec | F) 3.5 sec |
| G) 4.0 sec | H) 8.0 sec |



Please be honest in answering the next questions. You earn the same points no matter the answer.

8. I did the assessment
- A) By myself w/o any help or notes from anyone.
 - B) Using notes, but no one helped me.
 - C) I did most problems by myself
 - D) I needed help solving the quadratic.
 - E) I did my best, but I did NOT want to ask anyone to help.
 - F) I did my best, but no one was available to help me.

$$f(x) = ax^2 + bx + c$$

A **parabola** is the shape a quadratic function ~~($ax^2 + bx + c$)~~ makes when graphed.

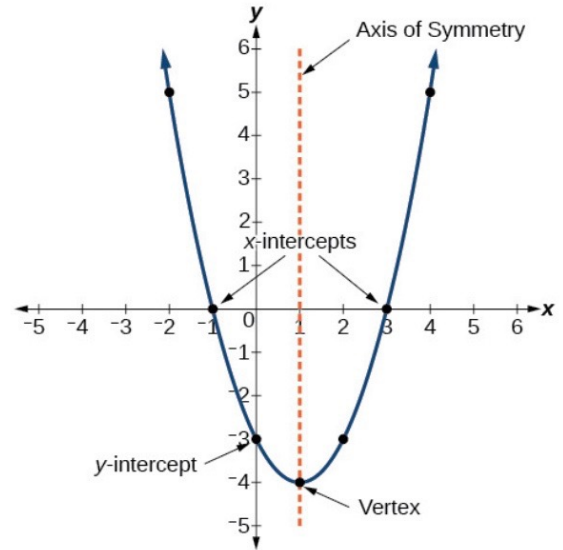
Vocabulary

x-intercepts: the points where the graph crosses the x-axis

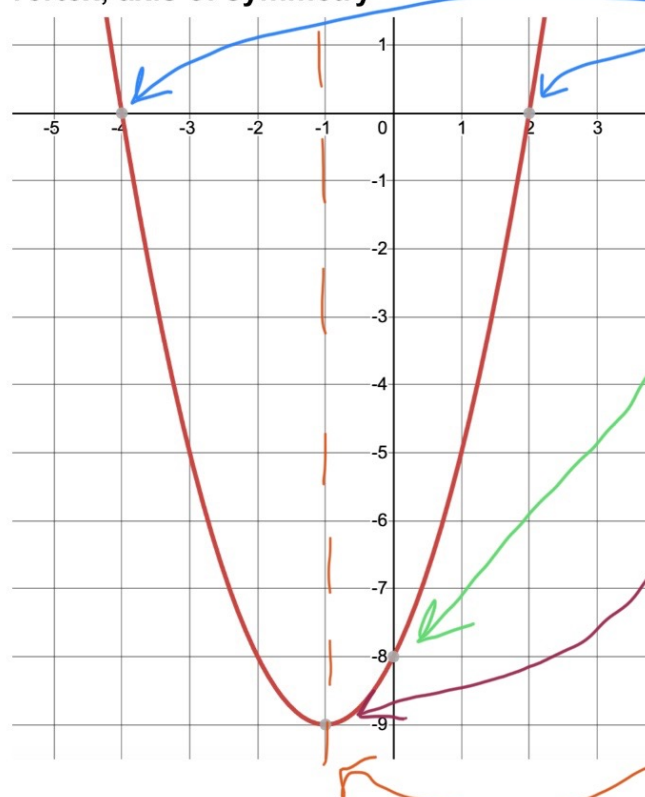
y-intercept: the point where the graph crosses the y-axis

Vertex: the highest or lowest point of a parabola

Axis of Symmetry: the line that cuts the parabola in half



Example 1: Describe the following features of the given parabolas: x-intercepts, y-intercept, vertex, axis of symmetry



x-intercepts:

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

y-intercept:

$(0, -8)$

Vertex:

$(-1, -9)$

AOS (axis of symmetry)

$x = -1$

Hint: the AOS is always the x value of the Vertex!

Vertex Form of a Quadratic

$$y = a(x - h)^2 + k$$

a is the **stretch**. IF a is **negative**, the parabola points **down**. If a is **positive**, it points **up**!

The point (h, k) is the **vertex**.

Remember: the ' h ' value is the opposite sign of what you see in the equation!

Intercept Form of a Quadratic

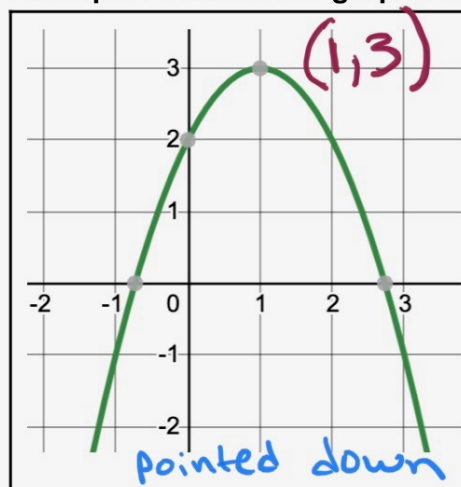
$$y = a(x - p)(x - q)$$

a is the **stretch**. IF a is **negative**, the parabola points **down**. If a is **positive**, it points **up**!

The points $(p, 0)$ and $(q, 0)$ are the **x-intercepts**.

Remember: the ' p ' and ' q ' values are the opposite sign of what you see in the equation!

Example 2: Match the graphs with the correct equation in vertex form.



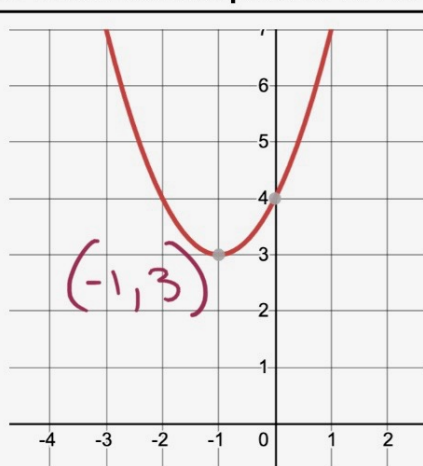
Matches Equation B
Because...

Vertex is $(1, 3)$

so, we want

$$y = a(x - 1)^2 + 3$$

↑
must be negative



Matches Equation C
Because...

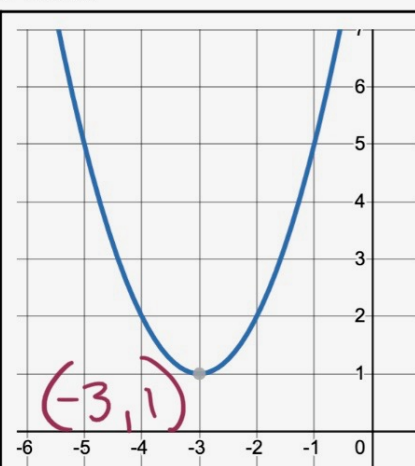
Vertex is $(-1, 3)$

so we want

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

↑
opposite sign!

Pointed up, so
 a is positive!



Matches Equation A
Because...

Vertex is $(-3, 1)$

so we want

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

↑
opposite sign

Pointed up,
so a is +

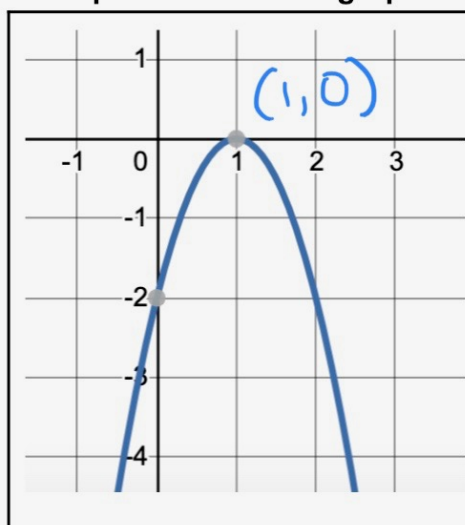
Equation A: $y = (x + 3)^2 + 1$

Equation C: $y = (x + 1)^2 + 3$

Equation B: $y = -(x - 1)^2 + 3$

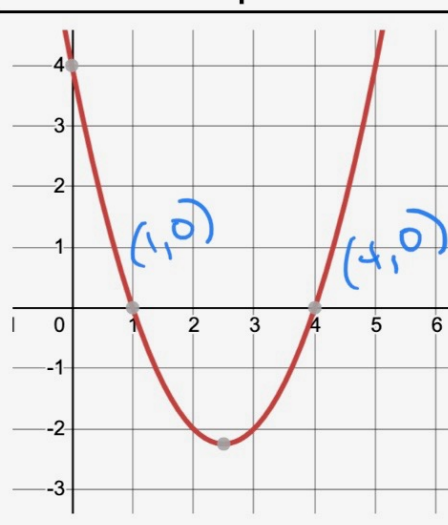
~~**Equation D:** $y = 3(x + 1)^2 + 1$~~
doesn't match any!

Example 3: Match the graphs with the correct equation in intercept form.



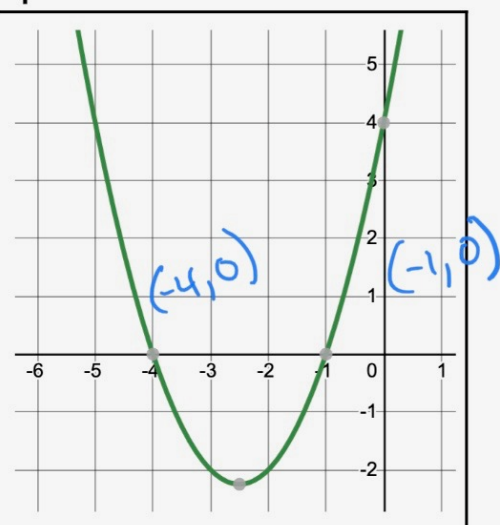
Matches Equation P
Because...

only one
x-intercept, so
we want
 $y = a(x-1)^2$
always opposite
sign
pointed down,
so a is
negative!



Matches Equation Q
Because...

Roots at $x=1$
and $x=4$, so
we want
 $y = a(x-1)(x-4)$
opposite signs!
pointed up, so
a is positive



Matches Equation S
Because...

Roots at $x=-4$
and $x=-1$, so
we want
 $y = a(x+4)(x+1)$
opposite signs
pointed up, so
a is positive

Equation P: $y = -2(x-1)^2$

Equation Q: $y = (x-4)(x-1)$

Hint: this
can also be
written as
 $y = (x-1)(x-4)$!

~~Equation R:~~ $y = (x+1)^2$ Doesn't match
any

Equation S: $y = (x+4)(x+1)$

Use the equation or the graph!

Example 4: Answer the questions about the given situations: Explain how you know.

- a. A kid jumps into a pool off of a tall diving board. Her path can be modeled by the function

$$h(x) = -\frac{1}{4}(x - 2)^2 + 9, \text{ where } h(x) \text{ is her height above water in feet and } x \text{ is time in seconds.}$$

What's the highest point that the kid reaches? 9 feet

Equation: vertex is (2,9), so 9 is the highest feet!

Graph: the highest point is here!

How long does it take for the kid to reach her highest point?

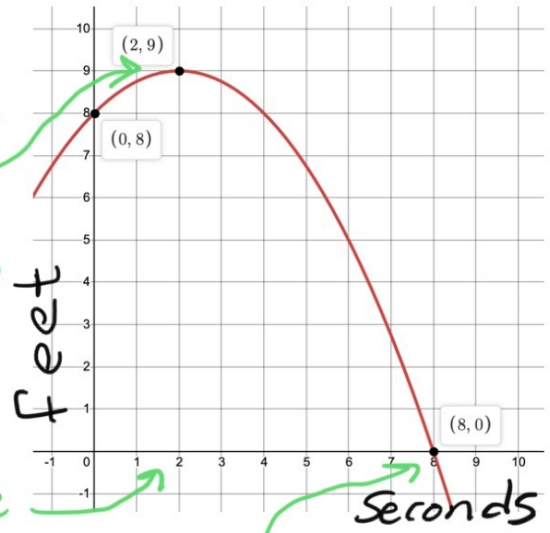
Equation: the x value of the vertex (2,9) is 2! 2 seconds

Graph: we know highest point, find x value

How long does it take for the kid to hit the water?

8 seconds Graph: look for x-intercept

Equation (challenging!) set $h(x) = 0$ and solve!



- b. A different kid decides to dive under water into a pool. His path can be modeled by the function

$$d(x) = \frac{1}{2}(x - 1)(x - 9), \text{ where } d(x) \text{ is his depth underwater in feet and } x \text{ is time in seconds.}$$

How many seconds does it take for this kid to enter the water?

Equation: the first x-intercept is 1. 1 second

Graph: look for 1st x-intercept

How many seconds does it take for this kid to resurface?

9 seconds

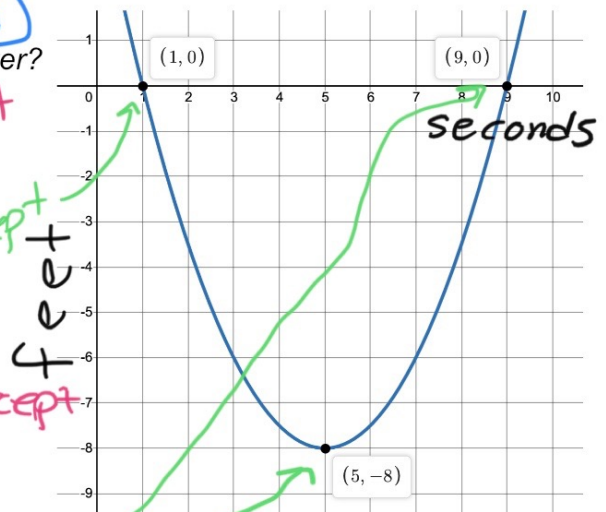
Equation: the second x-intercept is 9.

Graph: look for 2nd x-intercept

When does this kid reach his lowest point? How low does he swim?

Graph: find the vertex!

Equation: the vertex is the middle of 1 and 9, so 5. plug that in for x and you get $d(5) = -8$!



5 seconds, 8 feet deep