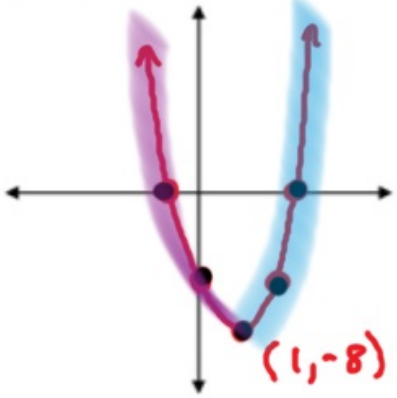
Math II Increasing and Decreasing Intervals.

Use DEMOS to create a sketch of the functions below. Label the VERTEX of the graph. In one color, trace where the graph is INCREASING. In a another color, trace where the graph is decreasing.

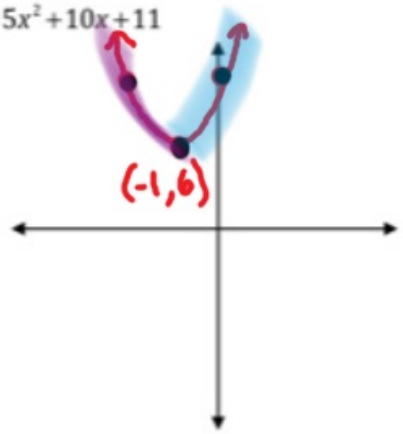
$f(x)=3x^2-6x-5$



Increasing Interval: $1 \leq x \leq \infty$

Decreasing Interval: $-\infty \leq x \leq 1$

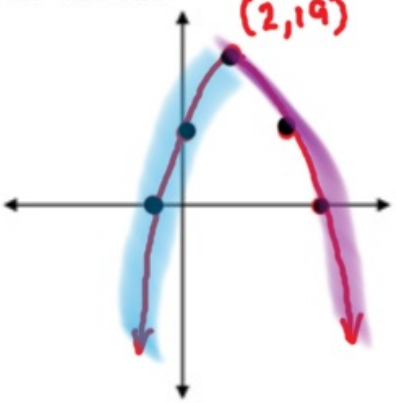
$f(x)=5x^2+10x+11$



Increasing Interval: $-1 \leq x \leq \infty$

Decreasing Interval: $-\infty \leq x \leq -1$

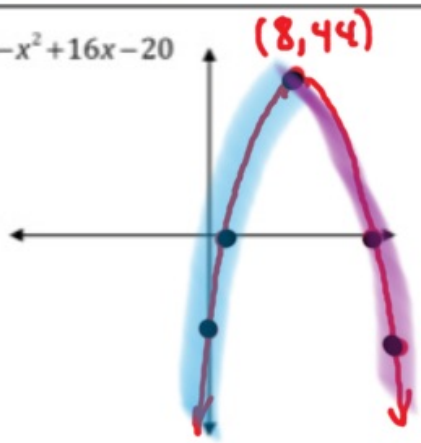
$f(x)=-2x^2+8x+11$



Increasing Interval: $-\infty \leq x \leq 2$

Decreasing Interval: $2 \leq x \leq \infty$

$f(x)=-x^2+16x-20$



Increasing Interval: $-\infty \leq x \leq 8$

Decreasing Interval: $8 \leq x \leq \infty$

Math II Increasing and Decreasing Intervals.

A company's weekly revenue in dollars is given by $r(x) = -2x^2 + 200x$, where x is the number of items produced during a week and r(x) if the revenue in dollars. . Use DESMOS to make a sketch of the function below. Label all intercepts and the vertex. Then proceed to answer the questions below.

- What amount of items will produce the maximum revenue?

50 items

- For what interval of items produced will the company see and INCREASE in revenue?

$0 \leq x \leq 50$

- For what interval of items produced will the company see and DECREASE in revenue?

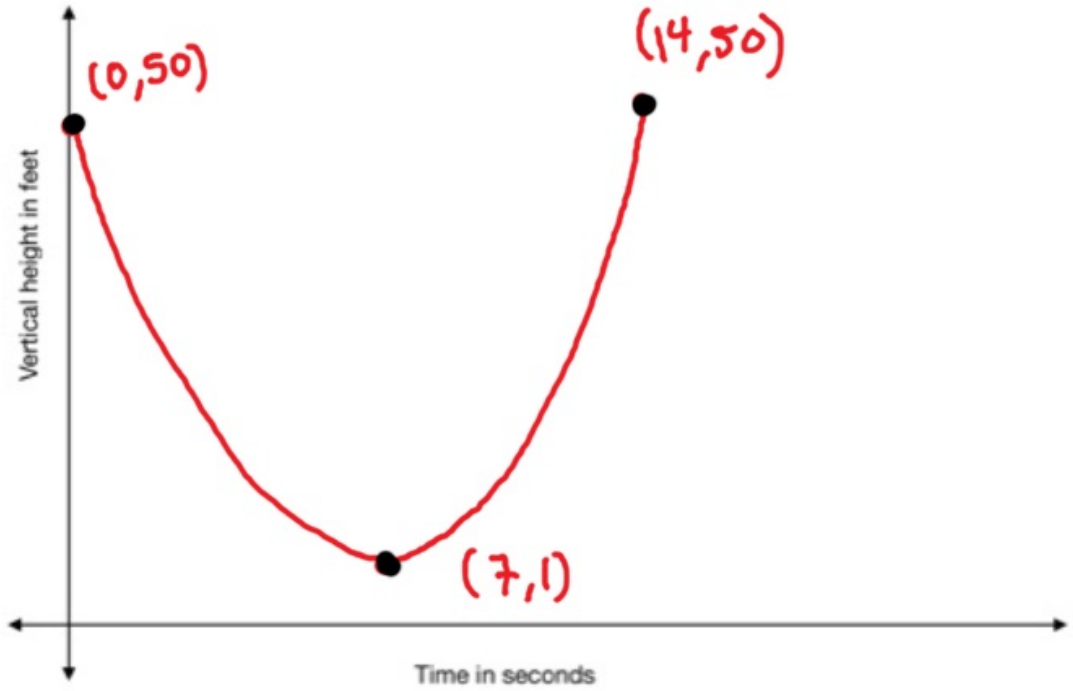
$50 \leq x \leq 100$

- What is the FEASIBLE DOMAIN of the function?

$0 \leq x \leq 100$

Math II Increasing and Decreasing Intervals.

A bird drives down from a branch to grab a worm that is on a log one foot from the ground. The bird then returns to the original branch it dove from. The model of the scenario is $h(t)=(x-7)^2+1$ where h(t) is vertical height in feet and "t" is time in seconds. Use DESMOS to make a sketch of the function below. Label all intercepts and the vertex. Then proceed to answer the questions below.



- After how many seconds is the bird at it's lowest point?

7 secs.

- For what interval of time is the bird's height DECREASING?

$0 \le x \le 7$

- For what interval of time is the bird's height INCREASING?

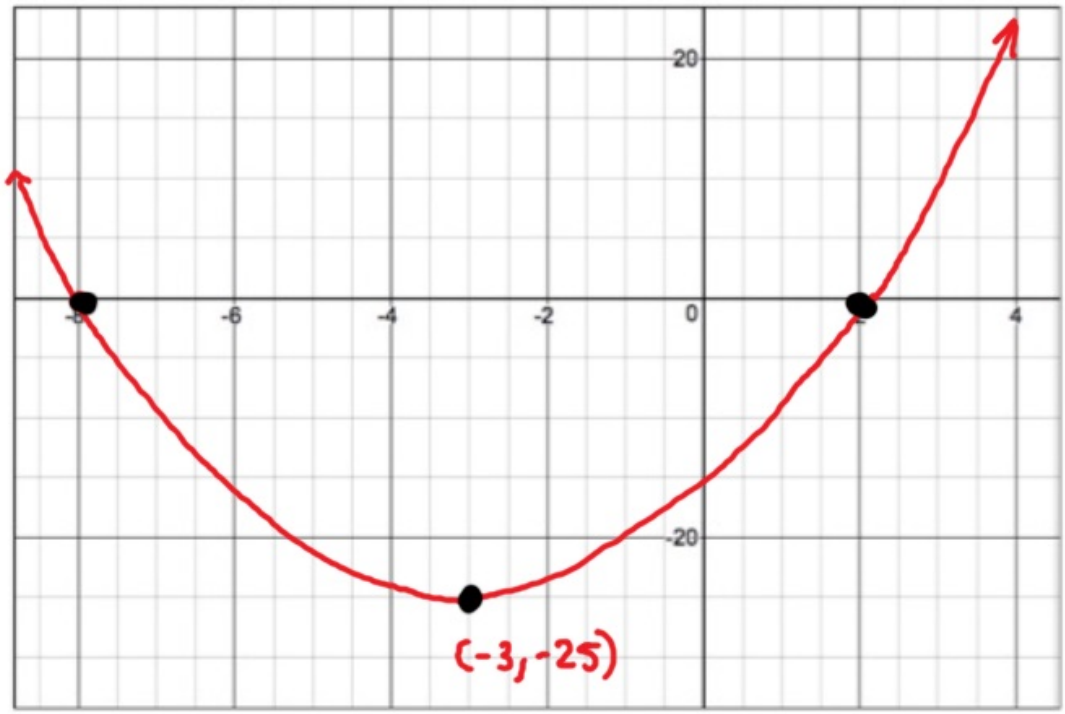
$7 \le x \le 14$

- What is the FEASIBLE DOMAIN of the function?

$0 \le x \le 14$

Math II Increasing and Decreasing Intervals.

A function has a minimum value of –25 and x-intercepts of –8 and 2.



- What is the value of x that minimizes the function?

-3

- For what values of x is the function increasing?

$-3 \leq x \leq \infty$

- For what values of x is the function decreasing?

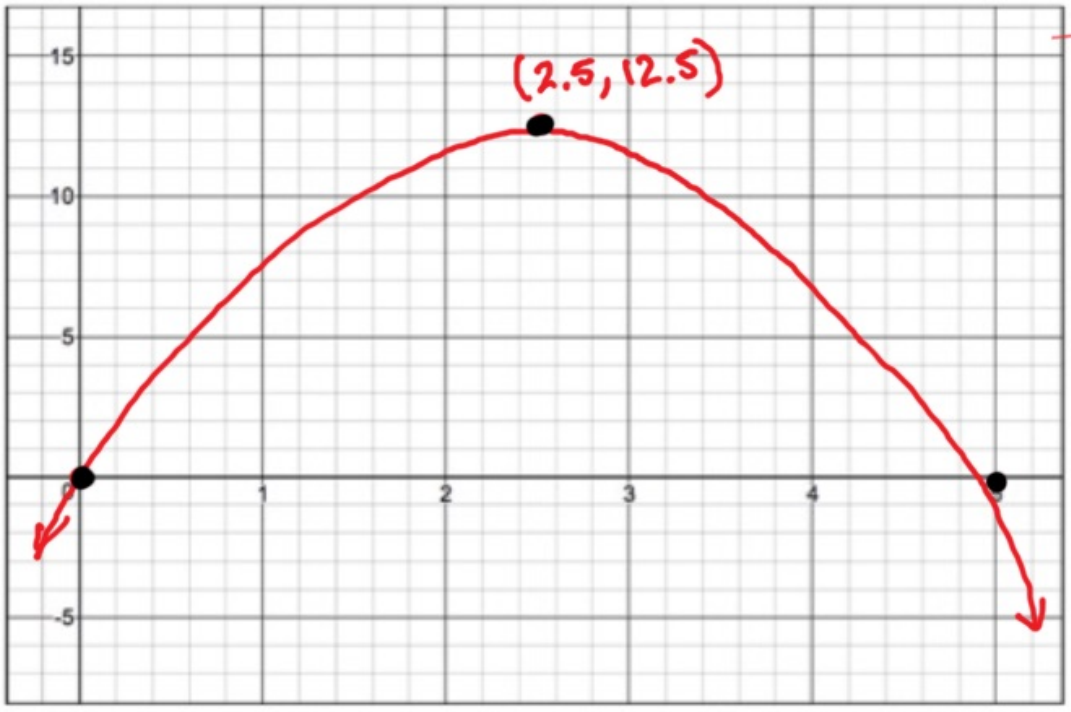
$-\infty \leq x \leq 3$

- What is the domain of the function?

$-\infty \leq x \leq \infty$

Math II Increasing and Decreasing Intervals.

A function has a maximum value of 12.5 and x-intercepts of 0 and 5.



- What is the value of x that ~~minimizes~~ maximizes the function?

2.5

- For what values of x is the function increasing?

$-\infty \leq x \leq 2.5$

- For what values of x is the function decreasing?

$2.5 \leq x \leq \infty$

- What is the domain of the function?

$-\infty \leq x \leq \infty$