Identifying Characteristics by Graphing (2)

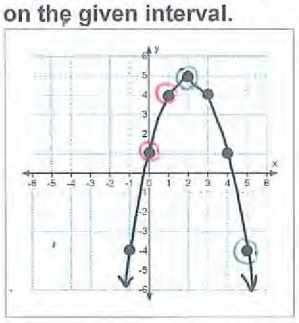
#7

The **average rate of change** of a function over a specified interval is the slope of the line that connects the endpoints of the function for that interval.

Finding average rate of change graphically:

1. Given an interval, find the two points of the function that correspond to the endpoints of the interval.
2. Draw a line through those points.
3. Find the slope of the line.

Calculate the average rate of change of the function on the given interval.



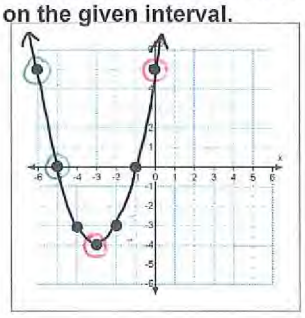
A) $0 \le x \le 1$

$\frac{\text{rise}}{\text{run}} = \frac{3}{1} = 3$

B) $2 \le x \le 5$

$\frac{\text{rise}}{\text{run}} = \frac{9}{-3} = -3$

Calculate the average rate of change of the function on the given interval.



A) $-6 \le x \le -5$

$\frac{\text{rise}}{\text{run}} = \frac{5}{-1} = -5$

B) $-3 \le x \le 0$

$\frac{\text{rise}}{\text{run}} = \frac{9}{3} = 3$

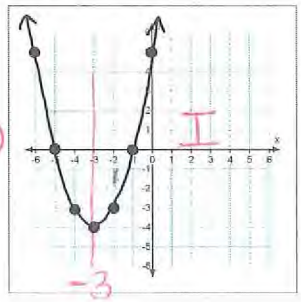
Interval of Increase: the part of the function in which both the x-values and y-values are increasing

Interval of Decrease: the part of the function in which as the x-values increase, y-values decrease

Finding Intervals of Increase/Decrease graphically:

1. Begin at the leftmost arrow of the parabola and take a "ride".
2. Identify the intervals:
   - -If you go downhill, it's an interval of decrease
   - -If you go uphill, it's an interval of increase

Find the interval of increase and decrease.



A) int of inc:

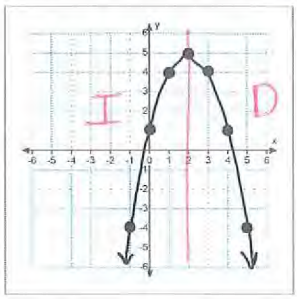
$x > -3$

B) int of dec:

$x \le -3$

Identifying Characteristics by Graphing (2)

Find the interval of increase and decrease.



A) int of inc: $x < 2$

B) int of dec: $x \geq 2$

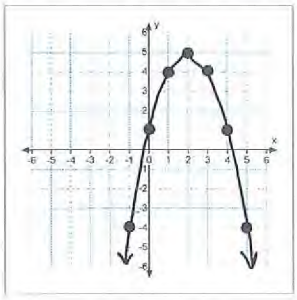
The **end behavior** of a function describes how the values of the function change as the x-values approch positive infinity and negative infinity.

Finding the end behavior graphically:

1. Determine the end behavior as $x \to -\infty$
2. Determine the end behavior as $x \to \infty$

Your answer will be ∞ or $-\infty$.

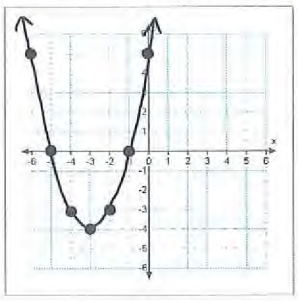
Determine the end behavior.



A) as $x \to -\infty$, $y \to$ $-\infty$

B) as $x \to \infty$, $y \to$ $-\infty$

Determine the end behavior.



A) as $x \to -\infty$, $y \to$ ∞

B) as $x \to \infty$, $y \to$ ∞