

Name: Key Date: _____

Characteristics of Linear Graphs

Interval Notation:

Represents an interval as a pair of numbers. The numbers are the endpoints of the interval. () and/or [] are used to show excluded or included.

Interval: $3 \leq x < 7$ $-6 < y \leq 4$
 $[3, 7)$ $(-6, 4]$

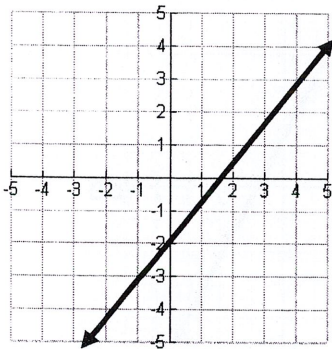
Domain and Range:

Domain: The x-values that are contained in the graph. Write it from left to right.

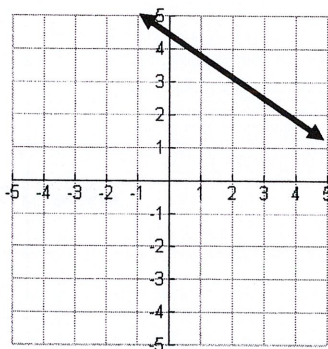
Range: The y-values that are contained in the graph. Write it from bottom to top.

Examples:

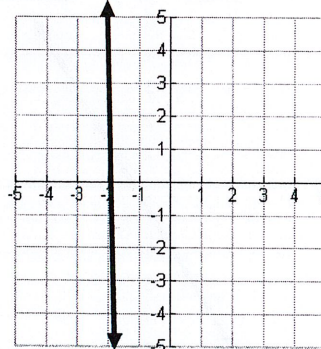
1) D: $(-\infty, \infty)$
 R: $(-\infty, \infty)$



2) D: $(-\infty, \infty)$
 R: $(-\infty, \infty)$



3) D: $[-2]$
 R: $(-\infty, \infty)$



Interval of Increasing and Decreasing:

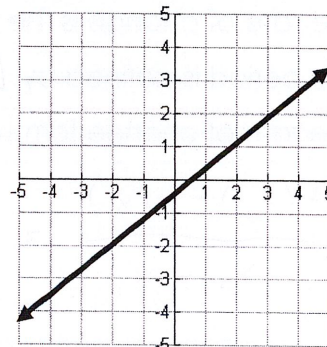
Always read from left to right

- If your finger is going up, the graph is increasing.
- If going down, the graph is decreasing.

Example:

Inc: $(-\infty, \infty)$ - yes, it is increasing

Dec: \emptyset - no, it isn't decreasing



Zeros/Roots/Solutions

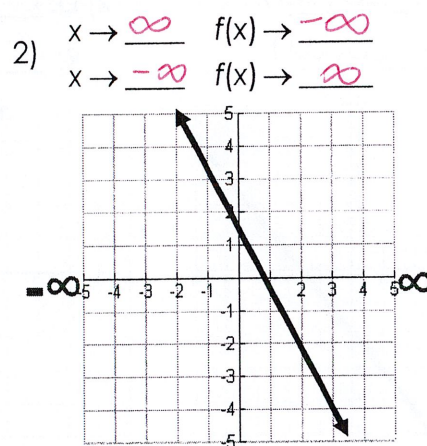
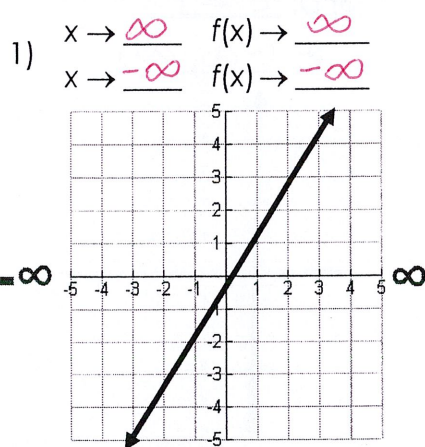
These are all synonyms for x-intercept. We write them as $x = \underline{\hspace{2cm}}$

Intercepts

- **x-intercept** – the point at which the line intersects the x-axis. $(x, 0)$
- **y-intercept** – the point at which the line intersects the y-axis. $(0, y)$

End Behavior:

- What a function keeps doing after it leaves the graph
- $x \rightarrow \infty$: As x goes to the right, where does y go?
- $x \rightarrow -\infty$: As x goes to the left, where does y go?

Rate of Change:

- The rate of change is the average slope of a graph over a given period
- The period is defined by $[x_1, x_2]$
- The rate of change formula is:

$$R.o.c. = \frac{f(x_2) - f(x_1)}{x_2 - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$