U1 L5B Analyzing Graphs of Functions

Name: _____ HR: _____

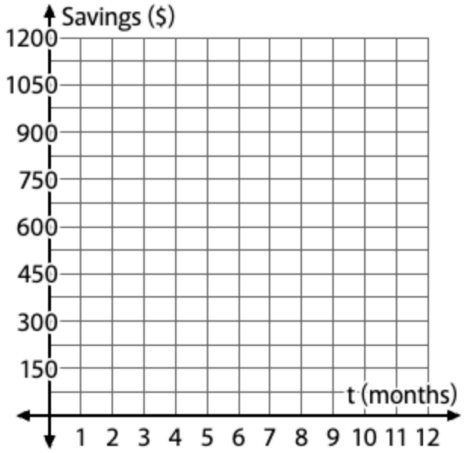
Skills: Use the Vertical Line Test, find zeros, determine increasing/decreasing intervals, find average rate of change, and identify even/odd functions.

Slope: A measure of rate of change. $m = \frac{y_2 - y_1}{x_2 - x_1}$

Ex: Maya has $150 in her saving. When she started her after school job she began adding $75 a month to her saving.

Equation:

Graph:



Slope/Rate of Change

Ex: Let f(x) = 150 + 75x Find the slope over the interval [1, 8]

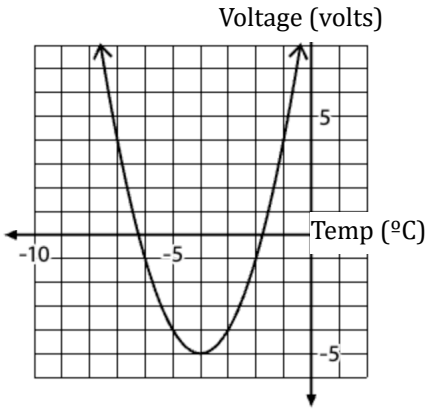
The slope of a linear equation is _____

Ex: Find the slope of f(x) if $f(5) = -10$ **and** $f(-3) = 34$

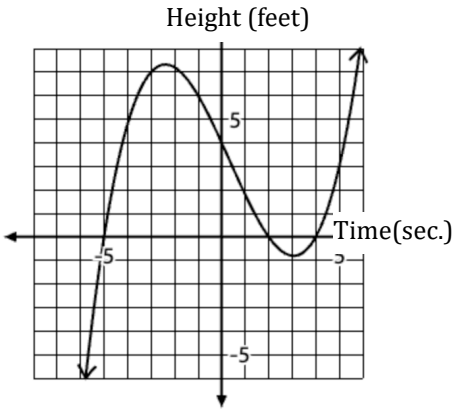
Average Rate of Change

This is just the slope formula applied to a curve — the slope of the secant line through two points.

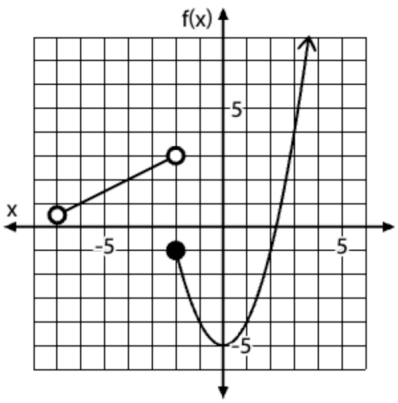
Ex. Find the average rate of change from $T = -5°C$ to $T = -1°C$



Ex: Find the average rate of change over the interval [-3, 2] seconds.



Ex: Find the average rate of change over the interval [-2, 3]



$$\text{Average Rate of Change} = m_{secant} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

Ex: f(x) = x³ − 3x

(a) from $x_1 = -2$ to $x_2 = -1$:

(b) from $x_1 = 0$ to $x_2 = 1$:

You try: f(x) = x² + 2x

(a) from $x_1 = -3$ to $x_2 = -2$:

(b) from $x_1 = -2$ to $x_2 = 0$:

Even and Odd Functions

Even	*Odd*	*Neither*
f(−x) = f(x) *symmetric about the y-axis: Ex:* $g(x) = x^4 + 7$	**f(−x) = −f(x)** *symmetric about the origin:* $M(x) = x^3 - x$	f(−x) matches neither f(x) nor −f(x) Ex: $f(x) = 10 + 4x$
Ex: g(x) = x⁴ − x² − 1	***Ex: h(x) = 2x³ + 3x***	***You try: f(x) = x³ − 4x***
Application: Average Speed A car's distance (ft) from a stoplight is $s(t) = 20t^{3/2}$, t in seconds. Find the average speed from t=0 to t=4 sec. You try: find the average speed from t=0 to t=9 sec.	***Section 1.5 Summary — Can you...*** ☐ Use the Vertical Line Test? ☐ Find the zeros of a function? ☐ Identify increasing/decreasing intervals and relative extrema? ☐ Find the average rate of change between two points? ☐ Determine if a function is even, odd, or neither?	***Formulas at a Glance — Section 1.5*** A.R.o.C. (average rate of change) = $$\frac{f(x_2) - f(x_1)}{x_2 - x_1}$$ Even: f(−x) = f(x) Odd: f(−x) = −f(x)