

1.4 Continued →

Difference Quotient:

$$\frac{f(x+h)-f(x)}{h} \quad h \neq 0$$

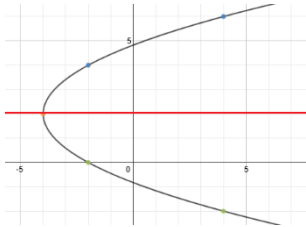
a. Find the difference quotient of

1.5 Analyzing Graphs of Functions

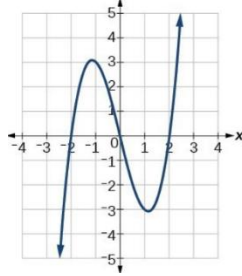
Vertical Line Test: a test used to see if the graph of something is a function. If you can draw a vertical line through your graph at ANY POINT, and the line hits the graph more than once, it is not a function.

Examples: Determine whether each is a function using the vertical line test.

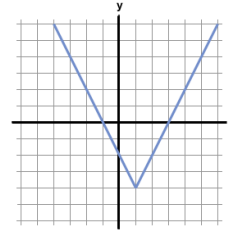
b.



c.



d.



Zeros of a Function: zeros of a function are the x values that make the function simplify to 0. $f(x) = 0$

To find them, set the function equal to 0, and solve for x.

Examples: Find the zeros of each function.

e.

f.

g.)

Average Rate of Change: the slope of the line between 2 points on a nonlinear graph whose slope changes at each point. This line is called the secant line, and its slope is defined as m_{sec}

$$m_{sec} = \frac{f(x_2)-f(x_1)}{x_2-x_1}$$

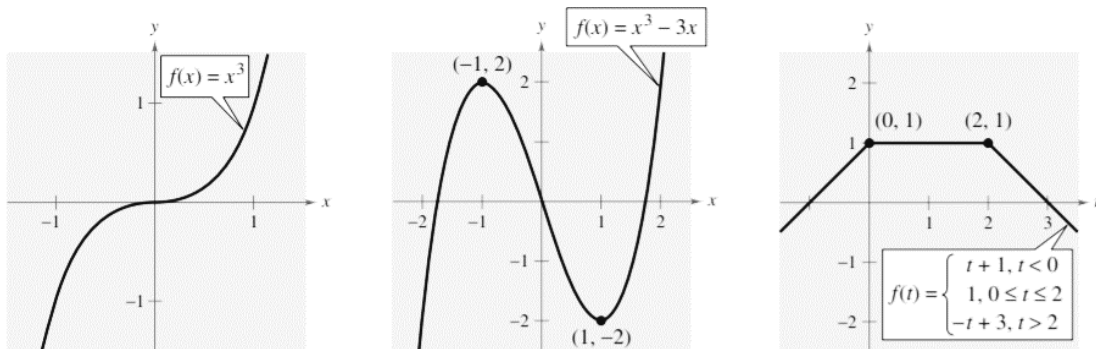
this also means: $\frac{\text{change in } y}{\text{change in } x}$

**remember that $f(x)$ is THE SAME THING as y

h. Find the average rate of change of

Increasing and Decreasing Functions: when following the graph of a function from left to right, it is increasing on the intervals in which it is moving upward, and is decreasing on the intervals it is moving downward. It is constant on intervals that there is no upward or downward movement.

Examples: Determine the intervals for which each function is increasing, decreasing, or remaining constant.



Even and Odd Functions:

A function is **even** if

A function is **odd** if

Examples: Determine whether each function is even, odd, or neither.

i.)

j.)

k.)