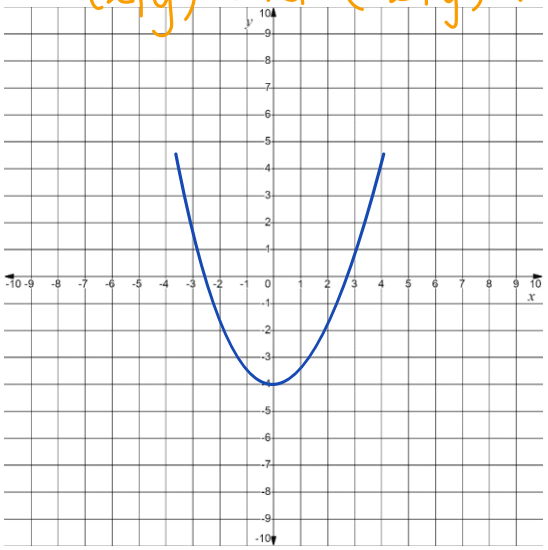
Name: _____ Date: _____

Learning Goal 1.1	Understanding new ideas about functions and applying that to previously knowledge.

Even Function has symmetry around the y-axis

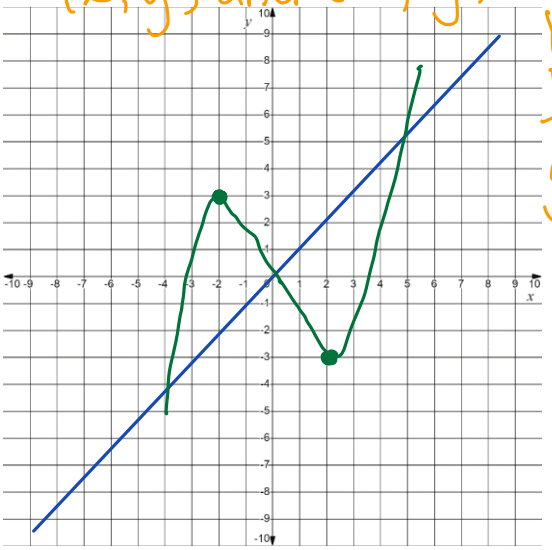
(x,y) and (-x,y) to both be on the graph.



$f(-x) = f(x)$

Odd Function has rotational symmetry of 180°

(x,y) and (-x,-y) to both be on the graph



$f(-x) = -f(x)$

Example Determine whether the function is even, odd or neither.

a. $f(x) = x^5 + x$

$f(-x) = (-x)^5 + (-x)$

$= -x^5 - x$

$= -(x^5 + x)$

ODD!

b. $g(x) = 1 - 2x^4$

$g(-x) = 1 - 2(-x)^4$

$= 1 - 2x^4$

$= g(x)$

EVEN

c. $h(x) = 2x - 3x^2$

$h(-x) = 2(-x) - 3(-x)^2$

$= -2x - 3x^2$

$= -(2x + 3x^2)$

NEITHER

Assignment p. # 57 – 66 Quiz Next Day!

4, 9 – 18, 47 – 55

The Difference Quotient

$$\frac{f(x+h)-f(x)}{h}$$ ← Basis of Derivatives when we let $h \to 0$

Example Evaluate the difference quotient for the following function. Simplify your answer.

a. $f(x) = 2 - x^2$

$f(x+h) = 2-(x+h)^2$

$= 2-(x^2+2xh+h^2)$

$= 2 - x^2 - 2xh - h^2$

$$\frac{f(x+h)-f(x)}{h} = \frac{[2-x^2-2xh-h^2]-[2-x^2]}{h}$$

$$= \frac{-2xh-h^2}{h}$$

$= -2x-h$

b. $y = -x^2 + 4x + 1$

$-(x+h)^2+4(x+h)+1$

$= -(x^2+2xh+h^2)+4x+4h+1$

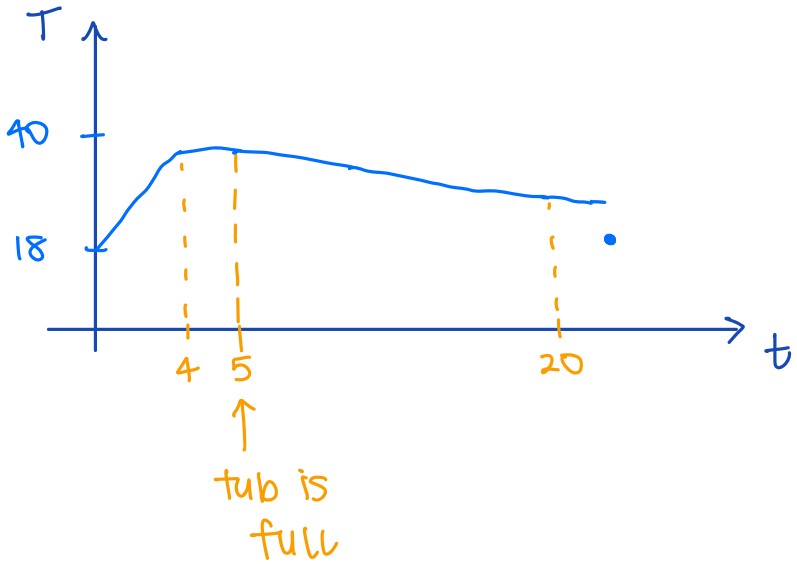
$= -x^2-2xh-h^2+4x+4h+1$

$$= \frac{[-x^2-2xh-h^2+4x+4h+1]-[-x^2+4x+1]}{h}$$

$$= \frac{-2xh-h^2+4h}{h}$$

$= -2x-h+4$

Example When you turn on a hot – water faucet, the temperature T of the water depends on how long the water has been running. Draw a rough graph of T as a function of the time t that has elapsed since the faucet was turned.



ASSUMPTIONS

- empty bathtub starting @ 18°C
- water is 40°C
- water runs for 5 min.