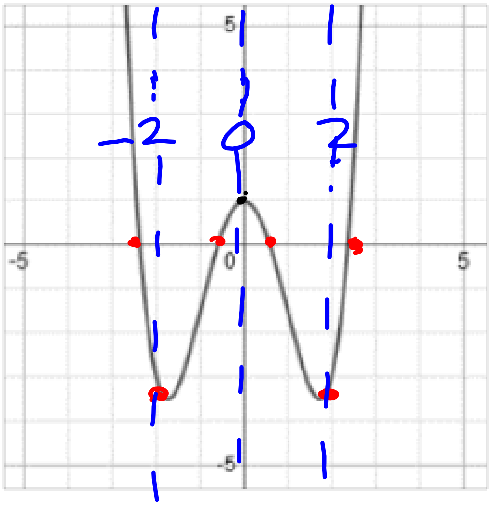
Bellwork: Identify the features listed for the graph



Increasing interval(s) $(-2,0)(2,\infty)$

Decreasing interval(s) $(-\infty,-2)$ $(0,2)$

Relative maximum(s) $(0,1)$

Relative minimum(s) $(-2,-3.5)$ $(2,-3.5)$

x-intercept(s) $(-2.5,0)$ $(-.5,0)$ $(.5,0)$ $(2.5,0)$

y-intercept $(0,1)$

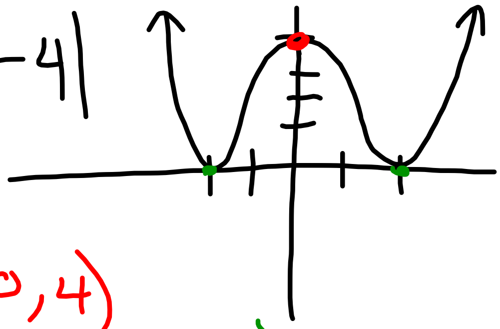
Bellwork: Classify the functions below as even, odd, or neither.

$f(x)=2x^2+4x+3$ neither

$f(x)=4x^2+7x^0$ even

$f(x)=3x^5-2x^3+4x^1$ odd

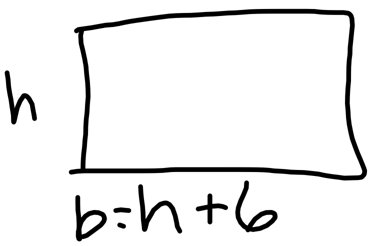
11) $|x^2-4|$



math → NUM
1. abs(

max: $(0,4)$
min: $(-2,0)$ $(2,0)$

8)



$A = h(h+6)$

$A(h) = h^2+6h$

Homework 2.2 Solutions

1.
   a. 41
   b. –19
   c. $-8n - 11$

2.
   a. 23
   b. –2
   c. $n^2 + 6n + 7$

3.
   a. $\frac{1}{9}$
   b. 81
   c. $\sqrt{3}$

4.
   a. –28
   b. –8
   c. –8

5.
   a. Translate left 7
   b. Reflect in the y-axis; Reflect in the x-axis
   c. Translate up 4; Vertical stretch by a factor of 3.

6.
   a. Translate left 10; Vertical shrink by a factor of ½.
   b. Reflect in the x-axis; Translate down 3; Vertical stretch by a factor of 2.
   c. Translate right 6; Translate up 4.

7.
   a. $f(x) = |x-1| - 3$
   b. $f(x) = -2|x| + 4$
   c. $f(x) = -|x+2|$
   d. $f(x) = \frac{1}{2}|x|$

8. $A(h) = (h)(h+6) = h^2 + 6h$

Homework 2.3 Solutions

1. Increasing interval(s): $(-4, \infty)$
   Decreasing interval(s): $(-\infty, -4)$
   Relative maximum(s): NA
   Relative minimum(s): $(-4, -1)$
   x-intercept(s): $(-6,0), (-2,0)$
   y-intercept: $(0,3)$

2. Increasing interval(s): $(-\infty, \infty)$
   Decreasing interval(s): NA
   Relative maximum(s): NA
   Relative minimum(s): NA
   x-intercept(s): $(-5,0)$
   y-intercept: $(0,4)$

3. Increasing interval(s): $(-2,3)$
   Decreasing interval(s): $(-\infty,-2),(3,\infty)$
   Relative maximum(s): $(3,1)$
   Relative minimum(s): $(-2,-4)$
   x-intercept(s): $(-6,0),(2,0),(4,0)$
   y-intercept: $(0,-2)$

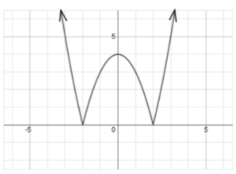
4. Increasing interval(s): $(-\infty,-4),(-2,0),(2,\infty)$
   Decreasing interval(s): $(-4,-2),(0,2)$
   Relative maximum(s): $(-4,1),(0,1)$
   Relative minimum(s): $(-2,-1),(2,-1)$
   x-intercept(s): $(-5,0),(-3,0),(-1,0),(1,0),(3,0)$
   y-intercept: $(0,1)$

5. Increasing interval(s): $(-\infty,\infty)$
   Decreasing interval(s): NA
   Relative maximum(s): NA
   Relative minimum(s): NA
   x-intercept(s): $(-4,0)$
   y-intercept: $(0,2)$

6. Increasing interval(s): NA
   Decreasing interval(s): $(-\infty,-1),(-1,\infty)$
   Relative maximum(s): NA
   Relative minimum(s): NA
   x-intercept(s): $(1,0)$
   y-intercept: $(0,1)$

7. $(-1,0)$; Minimum
8. $(3,5)$; Maximum
9. $(0,8)$; Maximum
10. $(-6,-4)$; Minimum

★ 11. Maximum: $(0,4)$
Minimums: $(-2,0),(2,0)$

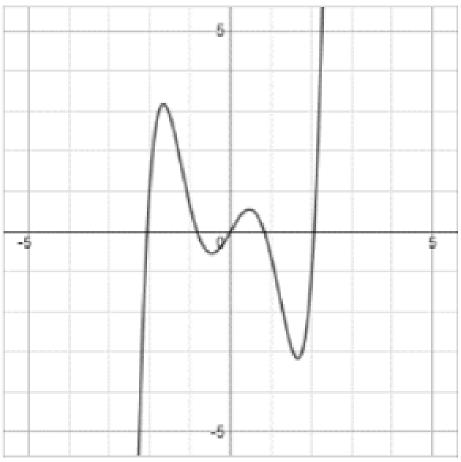


Lesson 2.4 Objectives

I can identify features of functions including: classification as odd, even, or neither; and rate of change over a given interval.

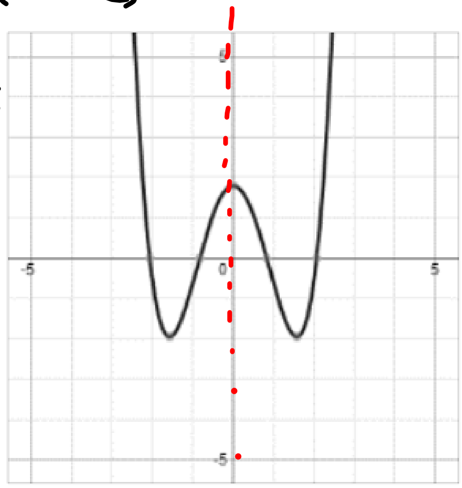
Odd Functions

- All degrees of x are odd.
- Rotational symmetry about the origin.
  - $-f(x) = f(-x)$



Even Functions

$x^2 + 3$



- All degrees of x are even.

★constants are even

- Reflective symmetry about the y-axis.
- $f(x) = f(-x)$

If a function does not fit the conditions for either ODD or EVEN, it is NEITHER even or odd

A non-zero constant term c is considered an even degree of x since it can be written cx^0.

2) Determine if the functions are even, odd, or neither

a) $f(x)=3x^2$ even

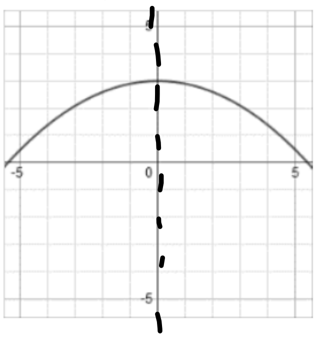
odd even

b) $f(x)=7x^5+1x^0$ neither

c) $f(x)=2x^3-8x^1$ odd

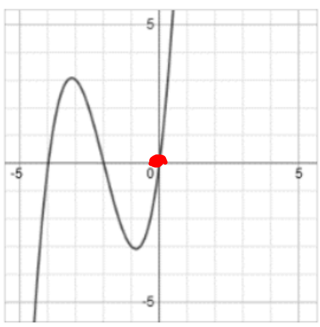
Determine if the functions are even, odd, or neither

even

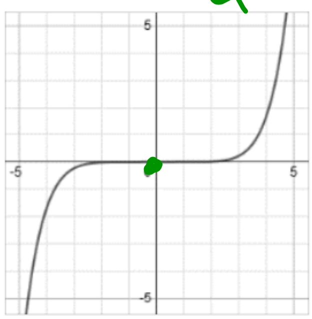
d) 

reflective symmetry over y-axis

neither

e) 

odd

f) 

rotational symmetry about orgin

$$\text{Average rate of change} = \frac{\Delta y}{\Delta x} = \frac{\text{change in y}}{\text{change in x}}$$

If you are given a domain interval $[a, b]$ = $\dfrac{f(b) - f(a)}{b - a}$

x_1 x_2

If you are given 2 points on the function (x_1, y_1) and (x_2, y_2) = $\dfrac{y_2 - y_1}{x_2 - x_1}$

The average rate of change of an increasing EXPONENTIAL function will always be GREATER than an increasing QUADRATIC function as $x \to \infty$

EXP > QUAD > linear

e^x x^2 x

For each function, *a*, *b*, *c*, and *d*, find the average rate of change on the interval $\overset{x_1\ \ x_2}{\underbrace{[-3,0]}_{a\ \ b}}$.

x	$a(x)$
-4	13
-3	11
-2	9
-1	7
0	5
1	3

$$m = \frac{f(0)-f(-3)}{0-(-3)}$$

$$\frac{5-11}{0+3} = \frac{-6}{3} = -2$$

$b(x) = 2^{x+4}$

$$\frac{f(0)-f(-3)}{0-(-3)}$$

$$\frac{2^4-2^1}{3} = \frac{16-2}{3} = \frac{14}{3}$$

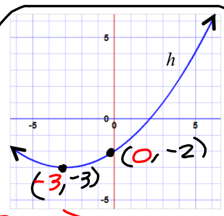
$c(x) = 4|x+2|$ $[-3,0]$

$$\frac{f(0)-f(-3)}{0-(-3)} = \frac{8-4}{0+3} = \boxed{\frac{4}{3}}$$

$f(0) = 4|0+2| = 4|2| = 8$

$f(-3) = 4|-3+2| = 4|-1|$

$= 4(1) = 4$



$[-3,0]$

$$\frac{y_2-y_1}{x_2-x_1}$$

$$\frac{-3-(-2)}{-3-0}$$

$$\frac{-3+2}{-3} = \frac{-1}{-3}$$

$$= \boxed{\frac{1}{3}}$$