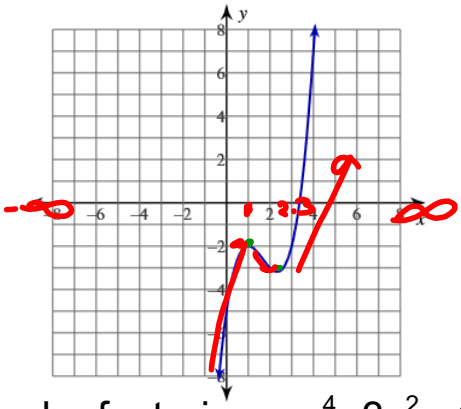
Calculator review

Warm up: Find the zero(s), relative max, relative min, interval of inc/dec

1) $y = x^3 - 5x^2 + 7x - 5$



zeros: 3.4

Rel. max: (1, -2) or -2

Rel. min: (2.3, -3.2) or -3.2

Interval of inc: $(-\infty, 1) \cup (2.3, \infty)$

Interval of dec: (1, 2.3)

2. Solve by factoring: $x^4 - 3x^2 - 4 = 0$

$(x^2-4)(x^2+1)=0$

$(x+2)(x-2)(x^2+1)=0$

$x+2=0$ $x-2=0$ $x^2+1=0$

$x=-2$ $x=2$ $x^2=-1$

$x=\pm i$

1. Describe the symmetry of an EVEN function.

Symmetric to y-axis

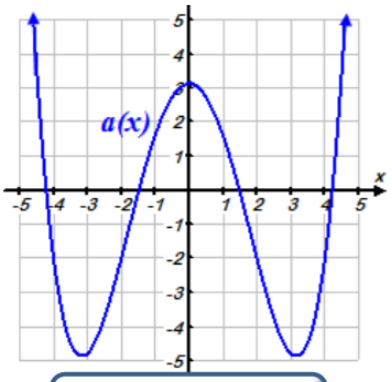
(can fold graph on y-axis & it lines up)

2. Describe the symmetry of an ODD function.

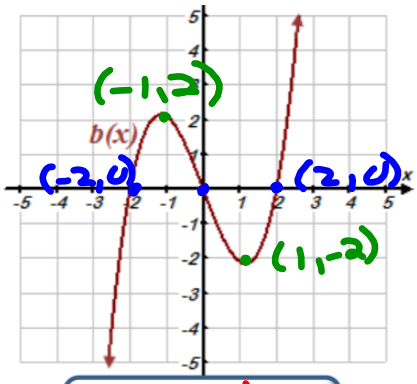
Symmetric to origin (rotate 180°)

rotate graph 180° & it looks exactly the same

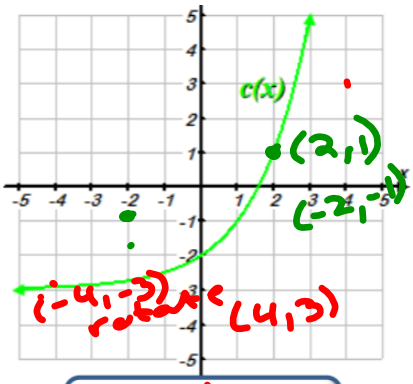
3. Describe each graph as EVEN, ODD, or NEITHER



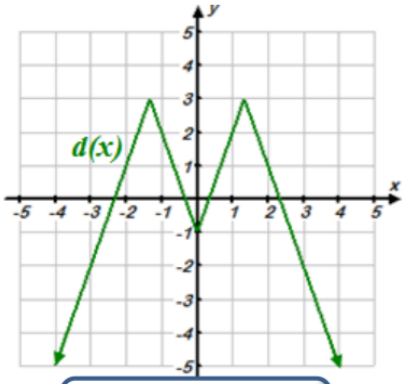
Even



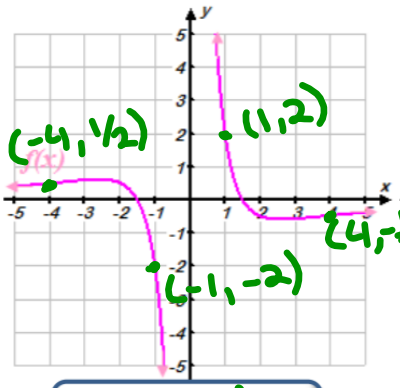
Odd



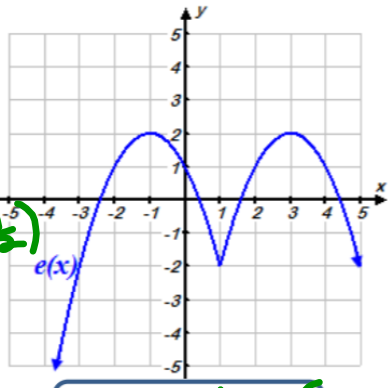
Neither



Even



Odd



Neither

4. Describe the definition in function notation of every EVEN function.

$(x, y) \rightarrow (-x, y)$

plug in $(-x)$ to equation & simplify signs & it will be exactly the same OR all even exponents (constant is even)

5. Describe the definition in function notation of every ODD function.

$(x, y) \rightarrow (-x, -y)$

plug in $(-x)$ to equation & simplify signs, it will be exactly the opposite of original

or all odd exponents (no constant)

6. Describe each function below as EVEN,ODD, or NEITHER.

a. $f(x) = x^2 + 5x^0$ same

$f(-x) = (-x)^2 + 5$

$= x^2 + 5$

Even symm.

b. $g(x) = x^3 - 2x^1$

Odd symm.

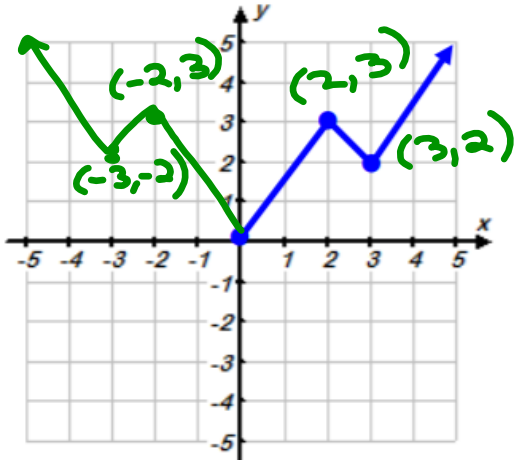
c. $h(x) = x^5 - 4$ considered even

Neither

d. $m(x) = x^4 + 3x^2 + 2x^0$

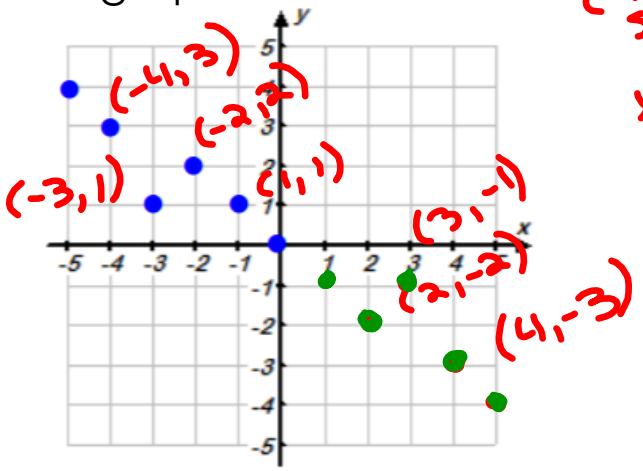
Even

7. If the partially graphed function below is EVEN, then finish what the rest of the graph should look like.



8. If the partially graphed function below is ODD, then finish what the rest of the graph should look like.

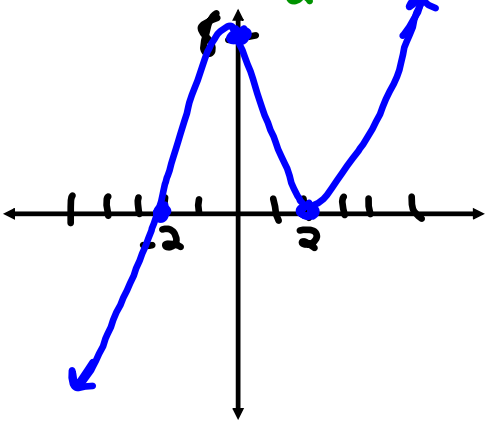
change signs of x & y



Sketch the graph. Show all zeros & y-intercept

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

(0+2)(0-2)² = 2·4



Zeros	Multiplicity	Cross or Bounce?
-2	1	cross
2	2	bounce

Y-intercept (plug in 0 for x)	(0,8)
Degree	3 odd
Leading Coefficient (+/-)	+
End Behavior	$x \to \infty, f(x) \to \infty$ $x \to -\infty, f(x) \to -\infty$

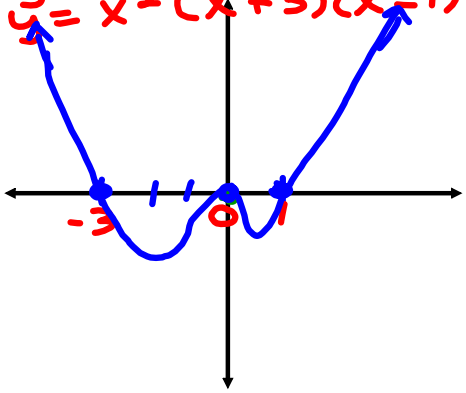
Sketch the graph. Show all zeros & y-intercept

Factor 1st!

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

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

$y = x^2(x+3)(x-1)$



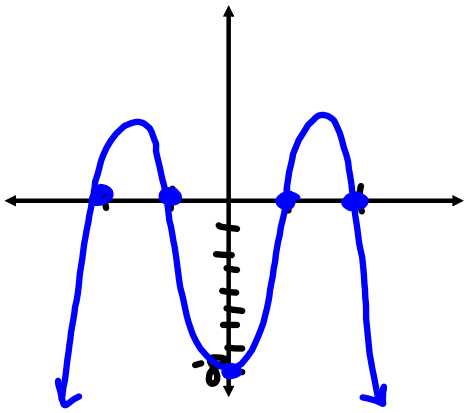
Zeros	Multiplicity	Cross or Bounce?
0	2	bounce
-3	1	cross
1	1	cross

Y-intercept	(0,0)
Degree	4
Leading Coefficient (+/-)	+
End Behavior	$x \to \infty, f(x) \to \infty$ $x \to -\infty, f(x) \to \infty$

Sketch the graph. Show all zeros & y-intercept

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

$-2(-4)(-1)(1)$



Zeros	Multiplicity	Cross or Bounce?
2	1	cross
-2	1	cross
1	1	cross
-1	1	cross

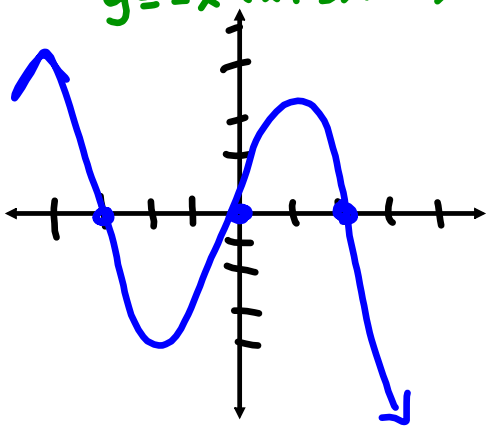
Y-intercept	(0, -8)
Degree	4 even
Leading Coefficient (+/-)	-
End Behavior	$x \to \infty, f(x) \to -\infty$ $x \to -\infty, f(x) \to -\infty$

Sketch the graph. Show all zeros & y-intercept

$$f(x) = -x^3 - x^2 + 6x$$

$y = -x(x^2 + x - 6)$

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



Zeros	Multiplicity	Cross or Bounce?
0	1	cross
-3	1	cross
2	1	cross

Y-intercept	(0, 0)
Degree	3 odd
Leading Coefficient (+/-)	-
End Behavior	$x \to \infty, f(x) \to -\infty$ $x \to -\infty, f(x) \to \infty$