

WARM UP

1) Write the polynomial in standard form with zeros at -3, 2 and 0.
 $x = -3, x = 2, x = 0 \quad x(x+3)(x-2) = x(x^2+x-6) = x^3+x^2-6x$

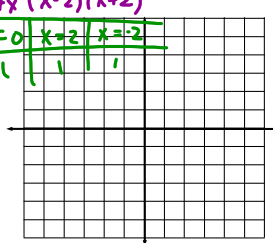
2) Identify the zeros and multiplicity of each.
 a) $f(x) = -x^2(x+3)(x-7)^3$ $\deg = 6$
 $-x^2 = 0 \quad x = -3 \quad x = 7$
 $x = 0 \quad x = 3 \quad x = 7$

b) $f(x) = 4x^3 - 16x$ $\deg 3$
 $= 4x(x^2 - 4)$
 $= 4x(x-2)(x+2)$

3) Simplify and classify it by degree and number of terms:
 $x(x-5)^2 - x(3x+7)$
 $x(x-5)(x-5) - 3x^2 - 7x = x^3 - 10x^2 + 25x - 3x^2 - 7x$
 $x^3 - 13x^2 + 18x - 7 = 0$

4) Factor, in order to solve: $4x^2 + 12x - 7 = 0$
 $-28 \quad 4x^2 + 14x - 2x - 7 = 0$
 $12 \quad 2x(2x+7) - 1(2x+7) = 0$
 $14-2 \quad (2x-1)(2x+7) = 0$
 $x = \frac{1}{2} \quad x = -\frac{7}{2}$

5) Get out your calculator.



Nov 16-12:15 PM

6.2 Polynomials and Linear Factors Part 2

**Objective: to graph higher power
polynomials using end behavior & zero's**

Get out your WB pg. 51

Nov 16-12:15 PM

POLYNOMIAL FUNCTIONS

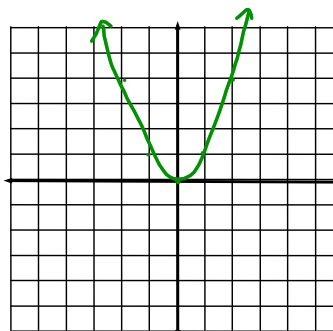
END BEHAVIOR

Degree: Even

Leading Coefficient: +

End Behavior: ↖ ↗

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



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POLYNOMIAL FUNCTIONS

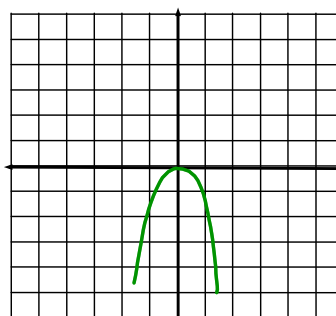
END BEHAVIOR

shape
Degree: Even

Leading Coefficient: -

End Behavior: ↘ ↙ *direction*

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



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POLYNOMIAL FUNCTIONS

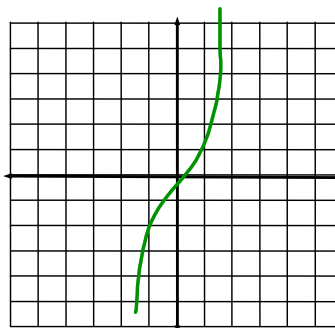
END BEHAVIOR

Degree: Odd

Leading Coefficient: +

End Behavior: ↙ ↗

$$f(x) = x^3 \quad \text{S shape}$$



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POLYNOMIAL FUNCTIONS

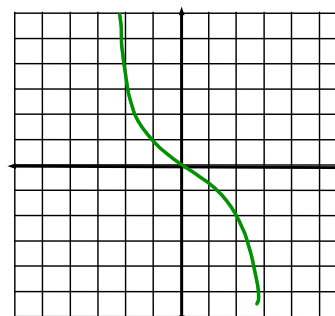
END BEHAVIOR

Degree: Odd

Leading Coefficient: -

End Behavior: ↘ ↙

$$f(x) = -x^3$$



Nov 16-12:15 PM

Check your understanding.
Use your arms to show you

understand end behavior.

Determine by inspection the end behavior of the graph of each function.

1. $y = 3x + 2$

3. $g(t) = -t^2 + t$

5. $g(x) = x^6$

7. $y = -7x^8$

9. $y = -\frac{1}{2}x^3 + 4x^2 + x - 1$

2. $y = 4x^3$

4. $f(x) = 2x + x^5$

6. $y = 3x^5 - 4x^4$

8. $f(x) = \frac{1}{2}x^4 - 2$

10. $g(x) = x - x^3 + 5$

Nov 2-6:04 AM

Multiplicity affects the shape of a polynomial.

If the multiplicity of a factor is:

even - the graph **bounces** off the x-axis at
multiplicity
the zero

odd - the graph **crosses** the x-axis at the
multiplicity
zero

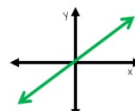
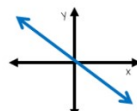
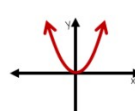

Nov 4-10:17 AM

REMEMBER!

WB pg. 51

How to find the End Behavior of Polynomial Functions

- Step 1: Identify the degree of the polynomial.
- Step 2: Is the degree an even or odd number?
- Step 3: Identify the leading coefficient of the polynomial.
- Step 4: Is the leading coefficient positive or negative?
- Step 5: Use the graphic organizer below to help you determine the end behavior of the polynomial function.

 <p>Degree: Odd Leading Coefficient: positive</p> <p>Similar end behavior as a positively sloped line such as $f(x)=x$</p> <p><i>Look at $y = x^3$ on your calculator to confirm.</i></p>	 <p>Degree: Odd Leading Coefficient: negative</p> <p>Similar end behavior as a negatively sloped line such as $f(x)=-x$</p> <p><i>Look at $y = -x^3$ on your calculator to confirm.</i></p>
 <p>Degree: Even Leading Coefficient: positive</p> <p>Similar end behavior as a parabola opening up such as $f(x)=x^2$</p> <p><i>Look at $y = x^4$ on your calculator to confirm.</i></p>	 <p>Degree: Even Leading Coefficient: negative</p> <p>Similar end behavior as a parabola opening down such as $f(x)=-x^2$</p> <p><i>Look at $y = -x^4$ on your calculator to confirm.</i></p>

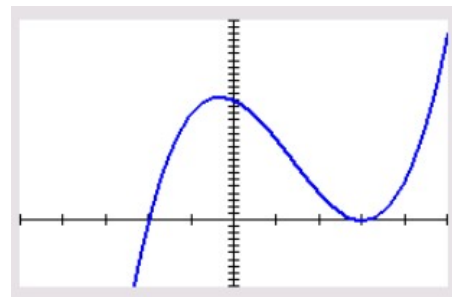
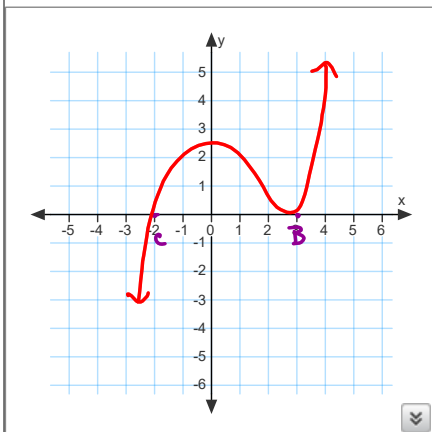
Oct 23-1:17 PM

Graph on your calculator-what do we know?

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

deg 3 S EB ↗

m $x = -2$ | $x = 3$ *m* 2
EVEN MULTIPLICITY -
BOUNCE ON THE X - AXIS



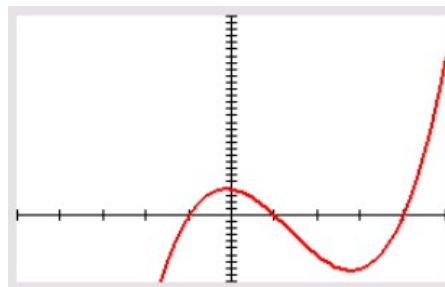
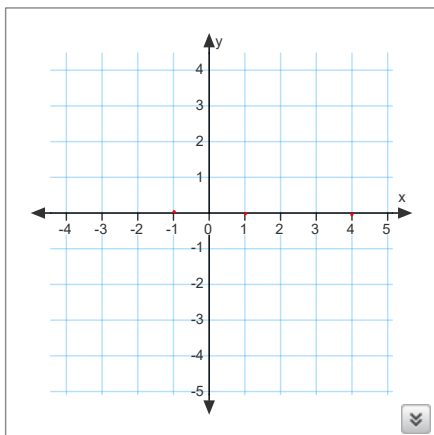
Nov 2-6:20 AM

Graph on your calculator-what do we know?

$$y = (x+1)(x-1)(x-4) \quad \text{deg } 3 \quad + \quad 5 \quad \swarrow \searrow$$

$x = -1 \quad x = 1 \quad x = 4$

**ODD MULTIPLICITY -
GO THROUGH THE X - AXIS**



Nov 2-6:20 AM

TO SKETCH, follow these steps.

WB pg. 51

1

click

Find zeros, by factoring if necessary

2

State the multiplicity of each zero

3

See multiplicity to decide if bounce or cross at x-axis

4

Determine the end behavior by TOTAL multiplicity
(deg & L.S.)

5

Sketch

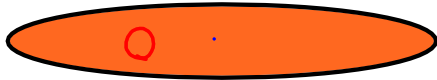
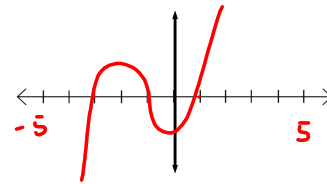
Oct 29-10:24 AM

Sketch the graph of the polynomial. Find the end behavior too!

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

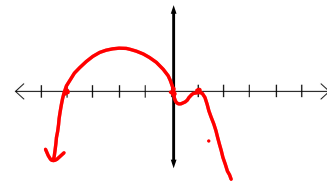
deg ↗ ↘

zero	multiplicity	bounce? cross?
-1	1	C
-3	1	C

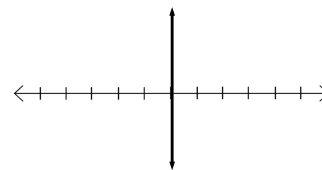


deg 4 ↘ ↙

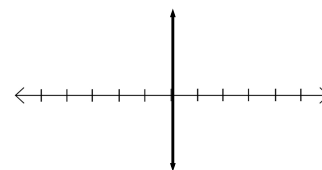
zero	multiplicity	bounce? cross?
0	1	C
-4	1	C
1	2	B



zero	multiplicity	bounce? cross?



zero	multiplicity	bounce? cross?

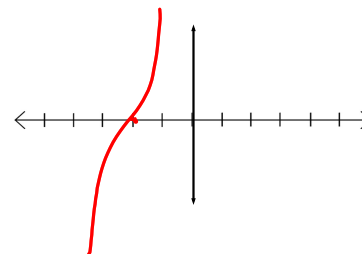


Nov 4-10:36 AM

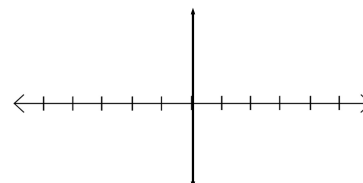
Write a polynomial function in standard form with the given zeros. State the end behavior. Then, sketch the curve. Last, confirm your sketch on your calculator.

4) -2 with a multiplicity of 3

$y = (x+2)^3$



5) -4, -4, 1



Nov 16-12:15 PM

Bottomline.....

Find zeros (by factoring if necessary)

state multiplicity,

know end behavior by TOTAL

multiplicity

and sketch.

Nov 29-11:37 AM



GO COUGARS!

HW 6.2 Part 2

p. 318

#41, 43-45, SKETCH showing all steps

47-48 (on calculator)

#51-52 - write equation

#54-56 SKETCH showing all steps

70-75

Nov 29-11:33 AM