Simplify. Write in standard form.
Then classify by degree and
number of terms

1) $(6x^2 - 5x + 3) - (9x^2 - 7)$

$-3x^2 - 5x + 10$ quad. trinomial

2) $3x(2x - 7) + 7x^4 - x$

$6x^2 - 22x + 7x^4$ quartic trin.

3) $\cancel{-x^2} + 7x^3 + \cancel{x^2}$

$7x^3$ cubic monomial

4) **Write an example of a cubic binomial.**

$x^3 - 1$

$3x^3 + 8x$

6.2 Polynomials

and

End Behavior

POLYNOMIAL FUNCTIONS

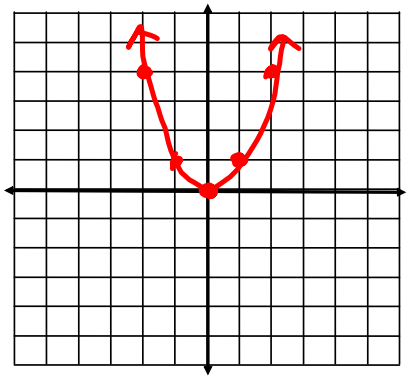
$f(x) = x^2$

Degree: Even

Leading Coefficient: +

End Behavior:

even degree
pos. leading coef.
EB: ↑↑



POLYNOMIAL FUNCTIONS

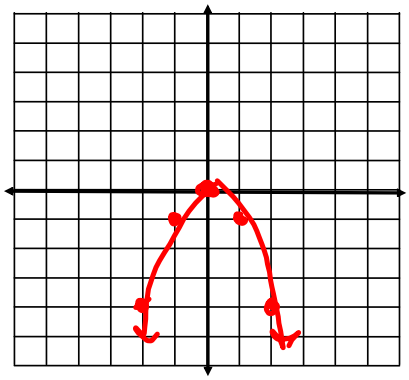
$f(x) = -x^2$

Degree: Even

Leading Coefficient: –

End Behavior:

Even deg.
neg lead. coef
EB: ↓↓



POLYNOMIAL FUNCTIONS

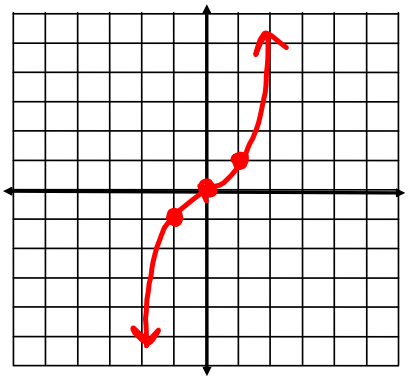
$f(x) = x^3$

Degree: Odd

Leading Coefficient: +

End Behavior:

odd degree
pos. lead coef
EB: ↓↑



POLYNOMIAL FUNCTIONS

$f(x) = -x^3$

Degree: Odd

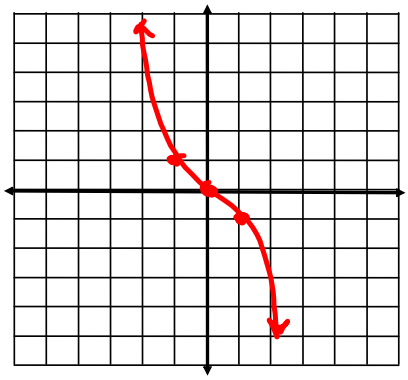
Leading Coefficient: –

End Behavior:

odd deg.

lead coef neg

EB: ↑↓



6.2 Polynomials and Linear Factors

Write the polynomial in standard form.

highest deg
lowest deg.

1) $(x+1)(x-2)(x+3)$

$x^2 - x - 2$

x	x^3	$-x^2$	$-2x$
$+3$	$3x^2$	$-3x$	-6

$x^3 + 2x^2 - 5x - 6$

odd pos

EB: ↓↑

Use foil or box for first two binomials.

Next, use foil or box method again to get final answer.

What is the end behavior?

Last, graph the original problem and your answer on your calculator. What do you notice?

Write the polynomial in factored form.

2) $2x^4 + 10x^3 + 12x^2$

$2x^2(x^2 + 5x + 6)$

First, use the GCF to simplify.

$2 \times 3 = 6$, $2 + 3 = 5$

$\boxed{2x^2}\boxed{(x+2)^1}\boxed{(x+3)^1}$

Next, keep on factoring.

$x = -2 \quad m = 1$

$x = -3 \quad m = 1$

$x = 0 \quad m = 2$

Last, graph the original problem and your answer. What do you notice?

You try!

3) Factor $3x^3 - 3x^2 - 36x$

$3x(x^2 - x - 12)$

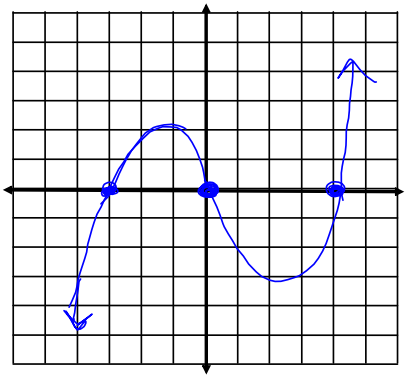
-12

$-4 \quad 3$

-1

$3x(x-4)(x+3)$

$x = 4, -3, 0$



EB: ↓↑ $3x = 0$ $x - 4 = 0$ $x + 3 = 0$

BEFORE checking on the graphing calculator, where do you think the graph will cross the x-axis?

Finding zeros, relative maximums and relative minimums from polynomial.

zero - where a graph crosses the x-axis
relative maximum - a high point of a graph
relative minimum - a low point of a graph

Use the zero product property from factored form to find the zeros of a polynomial.

4) Find the zeros of $y = x(x - 2)(x + 3)$

Now let's graph this on the calculator to find the relative max and relative min.

Where is max/min
- x-value

What is max/min.
- y-value

Multiplicity

The number of times a zero occurs for a polynomial

Find the zeros and state their multiplicity.

5) $y = (2x + 5)(x - 4)^2$

$-\frac{5}{2}$ $m=1$ 4 $m=2$

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

What is the end behavior of each polynomial?

$x = 0, 5, 5, -3$

$x(x-5)^2(x+3)$

Writing a polynomial equation.

Write a polynomial function in standard form with the given zeros.

7) x = 0, 5, 5, and -3

$x(x-5)^2(x+3)$

Check your understanding
Click the check mark to go to website review.

HW 6.2

p. 317 #1-35 odd