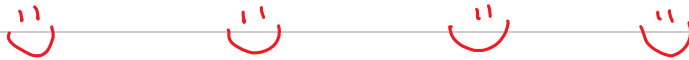


# 2.3 Intro & Limits

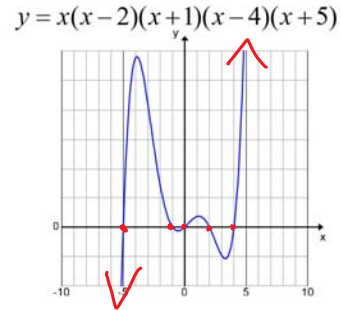
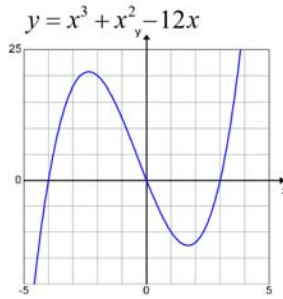
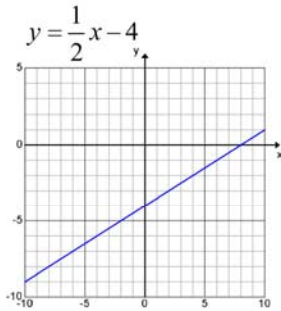
Wednesday, September 14, 2016 12:03 PM



Precalc 2.3 Introduction – Polynomial Patterns Name \_\_\_\_\_

Use the graphs below to answer the following questions.

### Odd Degree



Degree of function: 1

How many zeros? 1

How many max/mins? 0

End Behavior: As  $x \rightarrow \infty$ , what does  $y$  do? (circle one for each graph)

$\infty$   $-\infty$

$\infty$   $-\infty$

$\infty$   $-\infty$

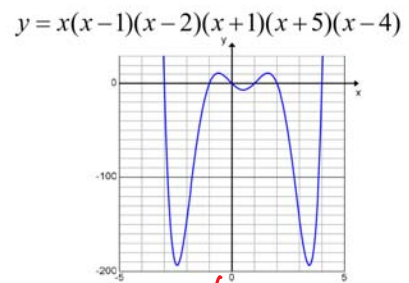
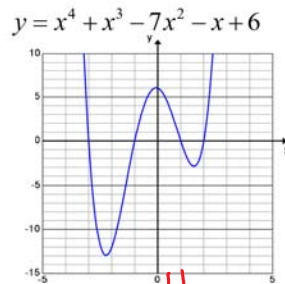
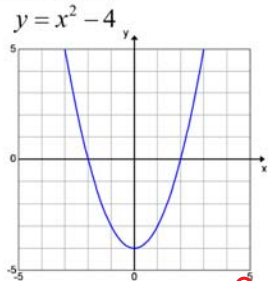
End Behavior: As  $x \rightarrow -\infty$ , what does  $y$  do? (circle one for each graph)

$\infty$   $-\infty$

$\infty$   $-\infty$

$\infty$   $-\infty$

### Even Degree



Degree of function: 2

How many zeros? 2

How many max/mins? 1

End Behavior: As  $x \rightarrow \infty$ , what does  $y$  do? (circle one for each graph)

$\infty$   $-\infty$

$\infty$   $-\infty$

$\infty$   $-\infty$

End Behavior: As  $x \rightarrow -\infty$ , what does  $y$  do? (circle one for each graph)

$\infty$   $-\infty$

$\infty$   $-\infty$

$\infty$   $-\infty$

Summary. Answer the following questions.

1. If a polynomial has degree N, how many zeros are possible?

N

2. If a polynomial has degree N, how many local maxes/minimums total will there be?

N-1

3. If a polynomial is an odd degree, do the ends of the graph go the same direction or the opposite direction?

opposite ↑  
↓

4. If a polynomial is an even degree, do the ends of the graph go the same direction or the opposite direction?

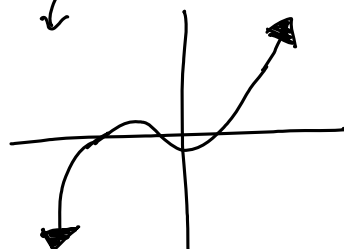
same ↑ ↑

5. What would happen if the leading coefficient of the function was negative?

reflect over the x-axis (zeros don't change)  
odd degree      even degree  
 ↑                      ↓      ↓

①  $f(x) = 4x^3 - 2x^2 + x - 10$

Deg = 3 L.C. positive



$\lim_{x \rightarrow -\infty} f(x) = -\infty$

Limit notation

$\lim_{x \rightarrow \infty} f(x) = \infty$

②  $f(x) = -4x^2 + 2$

Degree: 2 L.C. negative  
vert. refl. ↓ ↓

