

Oct 9-10:52 AM

### Polynomials

- ① Monomial "one" term  
 $5, x, 5x, -6y^3$
- ② Binomial "two" terms linked by addition  
 $(x-4), (-2y+3), (6x-4)$
- ③ Trinomial "three" terms linked  
 $x^2-x-12, y^3+2y^2-10$
- ④ Polynomial "many" terms linked  
 $6x^7+2x^5-3x^4+8$   
 Degree: 7

Oct 9-11:05 AM

### General Form

$$P(x) = \boxed{a_m} x^m + a_{m-1} x^{m-1} + a_{m-2} x^{m-2} + \dots$$

$a_m$  ← leading Coefficient  
 $m$  ← leading Exponent  
 $a_n x + a^0$

Oct 9-11:11 AM

### All Polynomials have Degree (number of solutions)

↓ leading Exponent

what is a Solution to a Polynomial?

 $f(x) = x^2 - x - 12$ 

two solutions

 $0 = x^2 - x - 12$ 
 $0 = (x-4)(x+3)$ 

①  $x=4$  &  $x=-3$

2 solutions (Real)

Value:  $(1, -12)$

Oct 9-11:13 AM

### Basic (Parent) Functions

- ①  $y = x$  or  $f(x) = x$   
 Line → Linear  
 $f(x) = 2x+2, y = 3x+2$   
 D:  $(-\infty, \infty)$   
 R:  $(-\infty, \infty)$
- ②  $y = x^2$  or  $f(x) = x^2$  (Quadratic)  
 Parabola → Curve  
  
 D:  $(-\infty, \infty)$   
 R:  $[0, \infty)$
- ③  $y = x^3$  or  $f(x) = x^3$  (Cubic)  
 Curve  
  
 D:  $(-\infty, \infty)$   
 R:  $(-\infty, \infty)$
- ④  $y = x^4$  or  $f(x) = x^4$   
 Curve → Parabolic-like  
  
 D:  $(-\infty, \infty)$   
 R:  $[0, \infty)$
- ⑤  $y = x^5$  or  $f(x) = x^5$   
 Curve → Cubic-like  
  
 D:  $(-\infty, \infty)$   
 R:  $(-\infty, \infty)$

Oct 9-11:23 AM

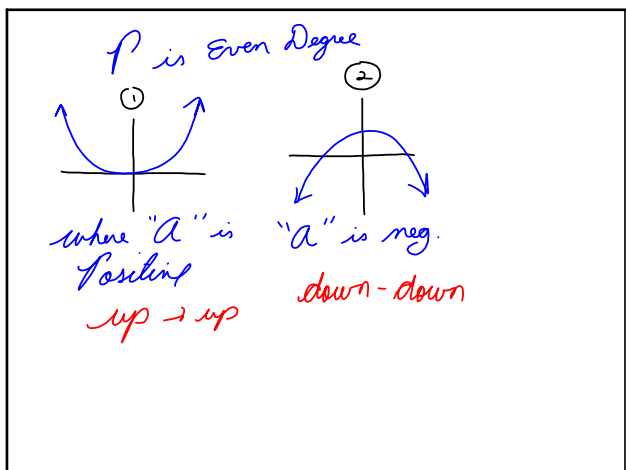
### End Behavior of Polynomials

$$P(x) = \boxed{a_m} x^m + a_{m-1} x^{m-1} + \dots$$

P is odd Degree

- ① where "a" is Positive  
 down → up
- ② "a" is neg.  
 up → down

Oct 9-11:34 AM



Oct 9-11:42 AM