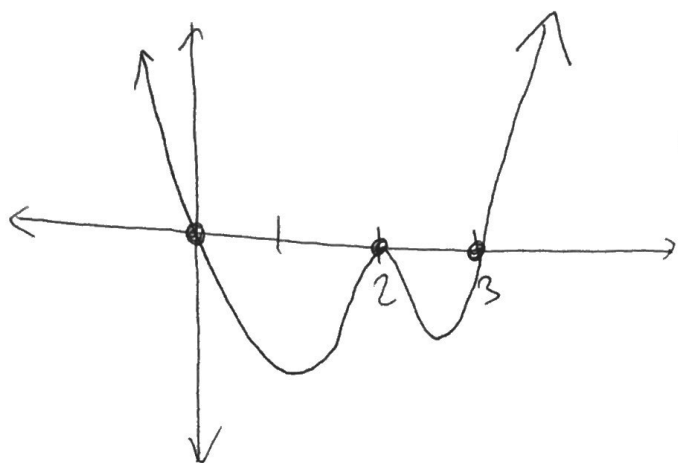


# Polynomials - General Review :



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

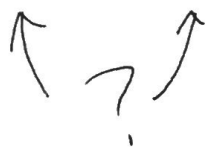
factor

roots: 2, 3, 0

double repeated real

roots: zeros: solutions  
 x-ints would be the coordinate associated with a root  
 (ex: (2,0))

even/pos



even/neg



odd/pos



odd/neg



degree: highest exponent when in standard form

standard ex:  $y = -2x^{10} + x^7 - x^2 + 23$

degree: 10

not standard ex:  $y = -(x-2)^2(x+4)(x-7)^3$

degree: 6

imaginary #s : negative under an even root

$$\sqrt{-1} = i$$

$$i^2 = -1$$

ex: quadratic: roots:  $2i, -2i$

	$x$	$-2i$	$-2i$
$x$	$x^2$	$-4i$	$-4i$
$2i$	$2x$	$-4i^2$	

$(x-2i)(x+2i)$   
 $x^2 - 4(-1)$   
 $x^2 + 4$

# The Fundamental Theorem of Algebra:

The degree matches the # of roots  
 includes: complex, real, repeated real  
 solutions  
 aka doubles

ex: degree 4 poly

2 real, 2 complex

1 repeated real, 2 complex

4 real

etc.

Synthetic Division:

$$(x^3 + 5x^2 - 7x + 2) \div (x - 2)$$

2	1	5	-7	2
	↓	2	14	14
	1	7	7	16
	$x^2$	$x$	$7$	$\frac{16}{R}$
	$x^2 + 7x + 7 + \frac{16}{(x-2)}$			

Division:

$$(2x^3 - x^2 + 3x - 1) \div (3x - 2)$$

	$x^2$	$7x$	$7$	$R$
$x$	$x^3$	$7x^2$	$7x$	$16$
$-2$	$-2x^2$	$-14x$	$-14$	

$$x^2 + 7x + 7 + \frac{16}{x-2}$$