

LT AA6 Cheat Sheet

<p>2 Terms $Ax^2 + Bx$ $Bx + C$</p> $\frac{x^2 + 2x}{x} \quad \frac{2x + 10}{2} \quad \frac{2}{2}$ $x(x+2) \quad 2(x+5)$	<p>3 Terms $a = 1$</p> $x^2 + 5x + 6 = (x+2)(x+3)$ $\begin{array}{cc} & 6x^2 \\ 3x & \times & 2x \\ & 5x & \end{array}$				
<p>2 Terms Difference of Squares</p> $\sqrt{x^2} - \sqrt{225}$ $(x-15)(x+15)$ $\sqrt{x^2} - \sqrt{169} = (x+13)(x-13)$	<p>3 Terms a isn't 1</p> $3x^2 + 19x + 20$ $\begin{array}{cc} 60x^2 & \\ 4x & \times & 15x \\ & 19x & \end{array}$ <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>$3x^2$</td><td>$15x$</td></tr> <tr><td>$4x$</td><td>20</td></tr> </table> $(3x+4)(x+5)$	$3x^2$	$15x$	$4x$	20
$3x^2$	$15x$				
$4x$	20				

$1^2 = 1$
 $2^2 = 4$
 $3^2 = 9$
 $4^2 = 16$

Adding/Subtracting Rational Expressions

$$\frac{x^2}{x+15} - \frac{225}{x+15}$$

$$\frac{x^2 - 225}{x+15} = \frac{(x-15)(x+15)}{(x+15)} = (x-15)$$

~~$\frac{2x+10}{x^2+5x+6}$~~

Multiplying/Dividing Rational Expressions

$$\frac{2x+10}{x^2+5x+6} \cdot \frac{3x+15}{x^2+2x}$$

$$\frac{2(x+5)}{(x+3)(x+2)} \cdot \frac{x(x+5)}{3(x+5)}$$

$$\frac{2x}{3(x+3)}$$

$$\frac{2x+3}{3x^2+19x+20} + \frac{x+1}{3x^2+19x+20}$$

$$\frac{3x+4}{3x^2+19x+20} = \frac{3x+4}{(3x+4)(x+5)} = \frac{1}{x+5}$$

$$X(X+4)$$

$$X=0 \quad X+4=0$$

$$-3x^3 + \underline{-6x^2} = -9x^3$$

$$9x^2 + \underline{12x^2} = 21x^2$$

$$-18x + \underline{-8x} = -26x$$

$$12 + \underline{0} = 12$$

Dividing Polynomials

Synthetic Division

$$(x^4 + 8x^3 + 21x^2 + 22x + 11) \div (x+3)$$

-3	1	8	21	22	11
	↓	-3	-15	-18	-12
	$1x^3 + 5x^2 + 6x + 4$				
	$\frac{-1}{x+3}$				

Box Method

$$(2x^4 - 9x^3 + 21x^2 - 26x + 12) \div (x-3)$$

2x	$2x^4$	$-6x^3$	$12x^2$	$-8x$	0
-3	$-3x^3$	$9x^2$	$-18x$	12	
$x^3 - 3x^2 + 6x - 4$					

End Behavior

Degree

Even Positive

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

Even Negative

$$x \rightarrow \infty, f(x) \rightarrow -\infty$$

$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

Degree

Odd Positive

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

Odd Negative

$$x \rightarrow \infty, f(x) \rightarrow -\infty$$

$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

Remainder Theorem and Factor Theorem

$(x-9)$ is a factor of $y = x^3 - 5x^2 - 32x - 36$

and x -intercept $= (9)^3 - 5(9)^2 - 32(9) - 36$

$= 0$, no remainder and $x-9$ is a

factor

How to write an equation from a graph

cross $(x-1)^1$
 bounce $(x-1)^2$
 wiggle $(x-1)^3$

1. Find intercepts (x)

$$y = a(x+6)(x+2)^2(x-4)$$

2. Plug in point or get pt. from graph

$$-64 = a(2+6)(2+2)^2(2-4)$$

$$-64 = a(8)(16)(-2)$$

$$-64 = -256a \quad a = .25$$

3. Solve for a

4. Rewrite

$$y = .25(x+6)(x+2)^2(x-4)$$

Sketching Polynomials on Graphs

1.) Find x -intercepts

$$(x-6) = 0 \quad x-2 = 0$$

$$x = 6 \quad x = 2$$

$$x+3 = 0$$

$$x = -3$$

2.) $y = \frac{1}{2}(0-6)(0-2)(0+3)$
 $= +18$

3.) Put x and y intercepts on graph

4.) Identify end behavior and degree
 odd, positive $x \rightarrow \infty, f(x) \rightarrow \infty$
 $x \rightarrow -\infty, f(x) \rightarrow \infty$