WILLIAM D. LAW, JR. LEARNING **COMMONS**

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Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Slope-intercept form	y = mx + b
Point-slope form	$y - y_1 = m(x - x_1)$ or $y = m(x - x_1) + y_1$
Slope of relational lines	$m_1 = m_2$; parallel $m_2 = \frac{-1}{m_1}$; perpendicular
Quadratic formula	Given $ax^2+bx+c=0$; $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Vertical line	x = a ; Undefined slope
Horizontal line	y = b; Slope = 0
x-intercept	Let y = 0; (f(x)=0, 0)
y-intercept	Let x = 0; (0, f(0))

Geometry Formulas

Area rectangle	A = L W
Perimeter of rectangle	P = 2L + 2W
Area of circle	$A = \pi r^2$
Circumference of circle	$C = 2\pi r$
Volume of a cube	$V = s^3$ or LWH

Math Translation Words

+ → Sum, increased by, addition, more than	x → Product, multiply, of
- →Difference, subtract, decreased by, less than	÷ →Divide, quotient
= → Equal, is	

*If AB = 0, then A = 0 or B = 0
*If $x^2 = k$, k > 0, then $x = \pm\sqrt{k}$

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Exponent Rules

$m^a m^b = m^{a+b}$	$(m^a n^c)^b = m^{ab} n^{bc}$
$\frac{m^a}{m^b} = m^{a-b}$	$m^{-a} = \frac{1}{m^a}$
$m^0 = 1$	$\sqrt[b]{m^a} = m^{\frac{a}{b}}$
n even, $\sqrt[n]{a^n} = \lvert a \rvert$	n odd, $\sqrt[n]{a^n} = a$
$i = \sqrt{-1}, i^2 = -1$	$\sqrt{-m} = i\sqrt{m}$

Factoring Summary

GCF:	$3x^2 + 9x + 15 \rightarrow 3(x^2 + 3x + 5)$	
4 terms-grouping	$3x^3 + 2x^2 - 6x - 4 =$ $(3x^3 + 2x^2) + (-6x - 4) =$ $x^2(3x+2) - 2(3x+2)$ $\rightarrow (3x+2)(x^2-2)$	
$\boldsymbol{a = 1}$	$x^2 + 4x - 12$:find factors of -12, add to 4, →(x - 2)(x+6)	
$\boldsymbol{x^2 - y^2}$	(x-y)(x+y)	
$\boldsymbol{x^2 + y^2}$	Does not factor/prime	
$\boldsymbol{ax^2 + bx + c}$ $\boldsymbol{a \neq 1}$	$3x^2 + 2x - 8$: factors of 3&8 that give difference of 2 24 1 24 2 12 3 8 4 6	(3,1) & (1,2,4,8) 4·1 – 3·2 = 4 – 6= -2 $3x^2 + 2x - 8 \rightarrow$ (3x - 4)(x + 2)
Perfect squares	$p^2 \pm 2pq + q^2$: $4x^2 - 12x + 9 \rightarrow (2x-3)^2$	

Factoring steps when solving quadratic:

1. Get the equation = 0
2. Factor out any common terms
3. Is it a difference of two squares?
4. Does it have 4 terms (grouping)
5. For a trinomial, use AC or trial/error.
6. Set all factors with a variable = 0 and solve.