EQUATIONS OF LINES

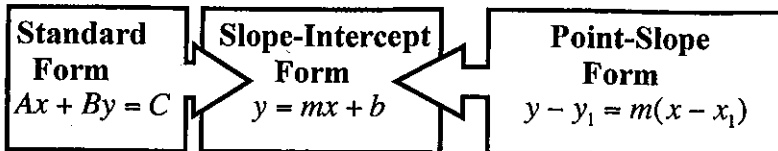| Standard Form $Ax + By = C$	Slope-Intercept Form $y = mx + b$	Point-Slope Form $y - y_1 = m(x - x_1)$

y-intercept: starting point, initial value, one-time flat fee
*Can only read slope from slope-intercept form.

Direct Variation
$y = kx$, where k is the constant of variation.

Parallel Lines = SAME SLOPES
Ex. $m = \frac{2}{3} \rightarrow m_{parallel} = \frac{2}{3}$

Perpendicular Lines = OPPOSITE RECIPROCAL SLOPES
Ex. $m = \frac{2}{3} \rightarrow m_{perpendicular} = -\frac{3}{2}$

Midpoint- Make a table.
(average x-values, average y-values)

Distance Formula
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Line of Best Fit
STAT EDIT L1, L2

STAT CALC 4:LinReg

Slope: rate of change
$m = \dfrac{rise}{run} = \dfrac{y_2 - y_1}{x_2 - x_1}$

Systems of Linear Equations
<u>Graphically</u>- when solved for y in both equations. The solution is the **point of intersection.**
Ex. $\begin{array}{l} y = 2x \\ y = -3x + 5 \end{array} \rightarrow$ intersect at point (1,2)

<u>Substitution</u>- when one equation has a variable isolated.
Ex. $\begin{array}{l} a = b + 3 \\ 4a + 2b = 72 \end{array} \Rightarrow$
$4(b + 3) + 2b = 72$
$4b + 12 + 2b = 72$
$6b + 12 = 72$
$\underline{-12 \quad -12}$
$6b = 60$
$b = 10$
$\Rightarrow \begin{array}{l} a = b + 3 \\ a = 10 + 3 \\ a = 13 \end{array}$

<u>Elimination</u>- when both equations are in Standard Form.
Ex. $\begin{array}{l} 2x + 3y = 10 \\ x - 2y = -2 \end{array}$

LOOK FOR PATTERNS!
CHECK YOUR ANSWERS!
BE SMARTER THAN THE TEST!

Exponential Functions
-Change % rate into decimal form.

Growth $\rightarrow A = P(1 + r)^t$
Decay $\rightarrow A = P(1 - r)^t$

Remember to simplify.
Ex. $\begin{array}{l} A = 500(1 + .03)^t \\ A = 500(1.03)^t \end{array}$

*Expect to predict next.

Quadratics-parabola
Vertex- maximum or minimum- 2ⁿᵈ TRACE

Roots/Solutions/Zeros- 2ⁿᵈ TRACE zero
Factoring-set equal to zero first.
$x^2 + 5x = 6$
$\underline{\quad -6 \quad -6}$
$x^2 + 5x - 6 = 0$
$(x + 6)(x - 1) = 0$
$\Rightarrow$
$\begin{array}{ll} x + 6 = 0 & x - 1 = 0 \\ -6 \ -6 & +1 \ +1 \\ x = -6 & x = 1 \end{array}$

Quadratic Formula
$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Exponents
$(-3)^2 \neq -3^2$ $\qquad x^m \cdot x^n = x^{m+n}$
$x^0 = 1$ $\qquad (y^2)^3 = y^2 \cdot y^2 \cdot y^2 = y^6$
$4^{-3} = \dfrac{1}{4^3}$ $\qquad \dfrac{z^m}{z^n} = z^{m-n}$

Polynomials
-Think about like-terms $\Rightarrow$ same variable and exponent.
-When multiplying polynomials, use the box method.

Factoring
-Greatest Common Factor
-Factor using the box method

Formulas
-Fill in what you know.
-Use equation solving to find the missing part.

Area of Rectangle $A = bh$	Area of Triangle $A = \frac{1}{2}bh$
Area of Circle $A = \pi r^2$	Perimeter- add all sides