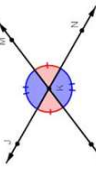


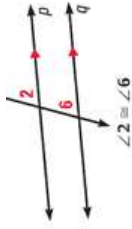
Formulas you should study and understand before taking the SAT:

Vertical (Opposite) Angles:



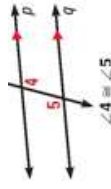
Linear Pairs: Two supplementary angles that together form a line.

Corresponding Angles:



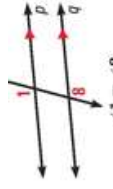
If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.

Alternate Interior Angles:



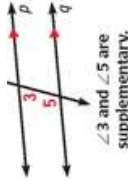
If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.

Alternate Exterior Angles:



If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent.

Same Side Interior Angles:



If two parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary.

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

Midpoint = $\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$

Linear Functions:

$$y = mx + b$$

$m = \text{slope} = \text{rate of change} = \frac{y_2 - y_1}{x_2 - x_1}$

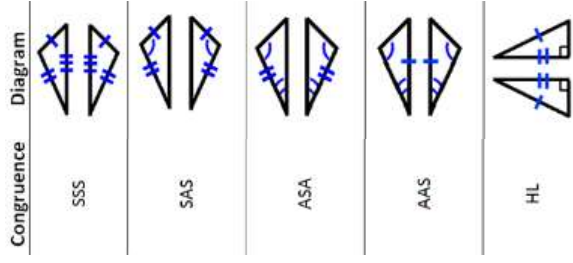
$b = \text{original value} = y - \text{intercept}$

Same Slopes → Parallel Lines

Opposite Reciprocal Slopes → Perpendicular Lines

Equation of a Circle: $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the center and r is the radius.

Triangle Congruence:



CPCTC: Corresponding Parts of Congruent Triangles are Congruent

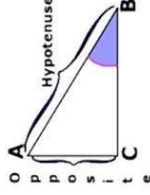
FOIL: $(a + b)(c + d) = ac + ad + bc + bd$

Triangle Similarity:

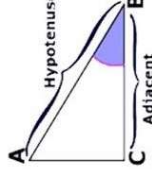
- AA Similarity Postulate
- SSS Similarity Theorem
- SAS Similarity Theorem

*Corresponding sides are proportional, and corresponding angles are congruent.

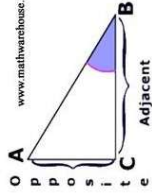
$$\sin(B) = \frac{\text{opposite}}{\text{hypotenuse}}$$



$$\cos(B) = \frac{\text{adjacent}}{\text{hypotenuse}}$$



$$\tan(B) = \frac{\text{opposite}}{\text{adjacent}}$$



mean ↔ average

median ↔ middle

mode ↔ most

range ↔ difference

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

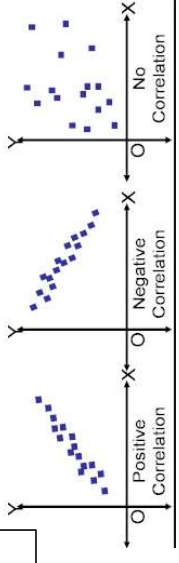
$$\text{Arc Length: } S = \frac{\theta^\circ}{360^\circ} \pi d$$

$$p(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of total outcomes}}$$

$$\pi = 180^\circ$$

$$\text{FOIL: } (a + b)(c + d) = ac + ad + bc + bd$$

SCATTER PLOT EXAMPLES



Quadratic Functions:

Solve for x when $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Vertex Form: $y = a(x - h)^2 + k$, where (h, k) is the vertex of the parabola.

$$\begin{aligned} i &= \sqrt{-1} \\ i^2 &= -1 \\ i^3 &= -i \\ i^4 &= 1 \end{aligned}$$

$$(\sqrt[n]{a})^m = a^{\frac{m}{n}}$$

Exponent Properties:

$$\begin{aligned} a^0 &= 1 & a^{-n} &= \frac{1}{a^n} & a^m \cdot a^n &= a^{m+n} \\ \frac{a^m}{a^n} &= a^{m-n} & (ab)^n &= a^n b^n & \left(\frac{a}{b}\right)^n &= \frac{a^n}{b^n} \\ (a^m)^n &= a^{mn} & \frac{1}{a^{-n}} &= a^n \end{aligned}$$

Exponential Functions: $y = ab^x$, where $a = \text{original value}$, $b = \text{growth or decay factor}$. If $0 < b < 1$, then the function is decaying. If $b > 1$, then the function is growing. (If $b = 0.2$, then there is 80% decay. If $b = 1.2$, then there is 20% growth.)