Geometry Formulas

Midpoint Formula

(on a line with endpoints a and b)

$$M(\frac{a+b}{2})$$

Midpoint Formula

(on a plane with endpoints (x_1, y_1) and (x_2, y_2)

$$M(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2})$$

Distance Formula

(on a plane with endpoints (x_1, y_1) and

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

Square

$$P = 4s$$

$$A = s^2$$

$$P = 2b + 2h$$

$$A = bh$$

Conditional Statements

Conditional \rightarrow $a \rightarrow b$ Converse $b \rightarrow a$ $\sim a \rightarrow \sim b$ Inverse \rightarrow Contrapositive→ $\sim b \rightarrow \sim a$

Triangle

$$P = a + b + c$$

$$A = \frac{1}{2}bh$$

Circle

$$C = d\pi$$
$$C = 2\pi r$$

$$A = \pi r^2$$

Triangle Angle-Sum Theorem

$$m \angle A + m \angle B + m \angle C = 180^{\circ}$$

Properties of Congruence

Reflexive Property $\angle A \cong \angle A$

Symmetric Property If $\angle A \cong \angle B$,

then $\angle B \cong \angle A$

Triangle Exterior Angle Theorem Transitive Property

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If $\angle A \cong \angle B$ and $\angle B \cong \angle C$,

then $\angle A \cong \angle C$

$$m \angle 1 = m \angle 2 + m \angle 3$$

Slope

(on a plane with endpoints (x_1, y_1) and (x_2, y_2)

$$m = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1}$$

Polygon Angle-Sum Theorem

Angle sum of a polygon is

$$(n-2)180$$

n = number of sides/vertices

Forms of Linear Equations

$$y = mx + b$$

$$m = slope$$
 $b = y - intercept$

$$y - y_1 = m(x - x_1)$$

m = slope (x_1, y_1) is a point on the line

Corollary to the Polygon Angle-Sum Theorem

One angle of a regular polygon is

$$\frac{(n-2)180}{}$$

n = number of sides/vertices

Polygon Exterior Angle-Sum Theorem

The sum of the exterior angles of a convex polygon is 360.

Trapezoid Midsegment Theorem

The midsegment of a trapezoid is the average of the bases.

Geometry Formulas

Pythagore	an Theorem	$45^{\circ}-45^{\circ}-90^{\circ}$ Triangle Theorem	
$leg_1^2 + leg_2^2 = hypotenuse^2$		$hypotenuse = leg \cdot \sqrt{2}$	
$a^2 + b^2 = c^2$ Trigonometric Ratios		$30^{\circ}-60^{\circ}-90^{\circ}$ Triangle Theorem	
Cosine	$\cos(angle) = \frac{Adjacent\ leg}{Hypotenuse}$	tong teg — short teg VS	
Tangent	$tan(angle) = \frac{Opposite leg}{Adjacent leg}$		

Rotations in the Coordinate Plane

$$r_{(90^{\circ},0)}(x,y) = (-y,x)$$
 $r_{(180^{\circ},0)}(x,y) = (-x,-y)$ $r_{(270^{\circ},0)}(x,y) = (y,-x)$ $r_{(360^{\circ},0)}(x,y) = (x,y)$

Parallelogram	Trapezoid	Rhombus
A = bh	$A = \frac{1}{2}h(b_1 + b_2)$	$A = \frac{1}{2}d_1d_2$

Kite	Regular Polygon	Triangle (given SAS)
$A = \frac{1}{2}d_1d_2$	$A = \frac{1}{2}ap$	$A = \frac{1}{2} side_1 \cdot side_2 \cdot \sin(included \ angle)$

Arc Length	Area of a Sector
length of arc = $\frac{arc\ measure}{360} \cdot d\pi$	$Sector\ Area = \frac{arc\ measure}{360} \cdot \pi r^2$

Area of a Segment		Euler's Formula	Density		
Sector Area — Triangle Area = Segment Area			F + V = E + 2	$D = \frac{m}{V}$	
Cylinder	Pyramid	Con	е	Sphere	
$LA = \pi dh$	1, 1,	LA =	$=\pi r l$	$SA = 4\pi r^2$	

$$LA = \pi dh$$

$$SA = \pi dh + 2\pi r^{2}$$

$$V = \pi r^{2}h$$

$$LA = \frac{1}{2}pl$$

$$SA = \frac{1}{2}pl + B$$

$$V = \frac{1}{3}Bh$$

$$LA = \pi rl$$

$$SA = \pi rl + \pi r^{2}$$

$$V = \frac{4}{3}\pi r^{3}$$

Equation of a Circle

(h,k) is the center of the circle

$$(x-h)^2 + (y-k)^2 = r^2$$