Geometry Reference Sheet

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

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

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

Slope Intercept Form: $y = mx + b$

Point-Slope Form: $y - y_1 = m(x - x_1)$

Circumference of a circle = πd or $2\pi r$

Equation of a circle = $(x - h)^2 + (y - k)^2 = r^2$
where (h, k) = center and r = radius

Area Formulas (*A*)

Square: $A = s^2$

Rectangle: $A = bh$

Parallelogram: $A = bh$

Trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$

Rhombus: $A = \frac{1}{2}d_1d_2$

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

Regular Polygon: $A = \frac{1}{2}$ Pa

Circle: $A = \pi r^2$

Sector area = $\frac{\text{central angle}}{360°} \times$ area of circle

Arc length = $\frac{\text{central angle}}{360°} \times$ circumference of circle

Logic/Reasoning

Conditional: $p \rightarrow q$

Converse: $q \rightarrow p$

Inverse: $\sim p \rightarrow \sim q$

Contrapositive: $\sim q \rightarrow \sim p$

Biconditional: $p \leftrightarrow q$

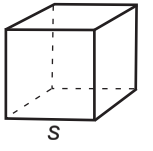
Euler's Theroem
The number of Faces (*F*), Vertices (*V*), and Edges (*E*) of a polyhedron are related by the formula $F + V = E + 2$.

Volume (*V*) and Surface Area (*SA*), where *B* is the area of the base and *P* is the perimeter of the base

Right Pyramid

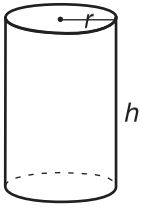
$V = \frac{1}{3}Bh$
SA = base area + sum of lateral face areas

Cube



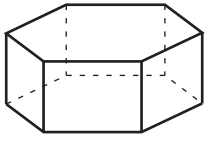
$V = s^3$
$SA = 6s^2$

Cylinder



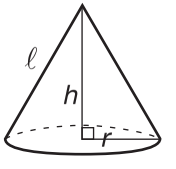
$V = Bh$
$SA = 2\pi r^2 + 2\pi rh$
or the sum of the base areas + the lateral surface area

Right Prism



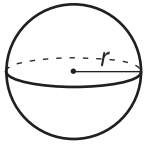
$V = Bh$
$SA = 2B + Ph$

Cone



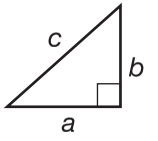
$V = \frac{1}{3}\pi r^2 h$
$SA = \pi r\ell + \pi r^2$

Sphere



$V = \frac{4}{3}\pi r^3$
$SA = 4\pi r^2$

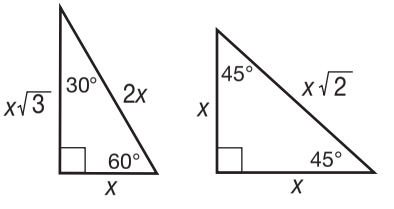
Pythagorean Theorem



$a^2 + b^2 = c^2$

Classifying Triangles
$c^2 > a^2 + b^2 \rightarrow$ obtuse triangle
$c^2 < a^2 + b^2 \rightarrow$ acute triangle
$c^2 = a^2 + b^2 \rightarrow$ right triangle
where *c* is the longest side of the triangle

Special Right Triangles

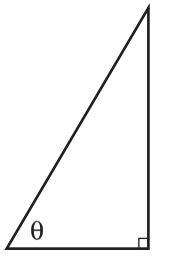


Trigonometric Ratios/Formulas

$\sin\theta = \frac{\text{opp}}{\text{hyp}}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}}$

$\tan\theta = \frac{\text{opp}}{\text{adj}}$



Geometría
Hoja de Referencia

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

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

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

Forma pendiente-ordenada de una recta en pendiente: $y = mx + b$

Forma punto-pendiente de una recta: $y - y_1 = m\,(x - x_1)$

Circunferencia de un círculo $= \pi d$ o $2\pi r$

Ecuación de un círculo $= (x - h)^2 + (y - k)^2 = r^2$
donde (h, k) = centro y r = radio

Fórmulas de Área (*A*)

Cuadrado: $A = s^2$

Rectángulo: $A = bh$

Paralelogramo: $A = bh$

Trapecio: $A = \frac{1}{2}(b_1 + b_2)h$

Rombo: $A = \frac{1}{2}d_1d_2$

Triángulo: $A = \frac{1}{2}\ bh$

Polígono Regular: $A = \frac{1}{2}$ Pa

Círculo: $A = \pi r^2$

Área del Sector $= \frac{\text{Ángulo Central}}{360°} \times$ area del círculo

Largo del Arco $= \frac{\text{Ángulo Central}}{360°} \times$ circunferencia del círculo

Razonamiento/Lógica

Enunciado Condicional: p → q

Converso: q → p

Inverso: ~ p → ~ q

Contrapositivo: ~ q→ ~ p

Bicondicional: p ↔ q

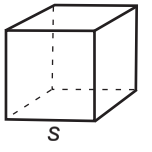
Teorema de Euler
Los números de caras (*F*), vértices (*V*), y bordes (*E*) de un poliedro están relacionados por la fórmula $F + V = E + 2$.

Volumen (*V*) y Área de Superficie, donde *B* es el área de la base y *P* es el perímetro de la base

Pirámide Recta

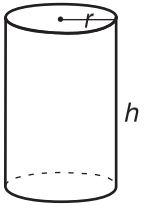
$V = \frac{1}{3}Bh$
SA = Área de la base + suma del área lateral de las caras

Cubo



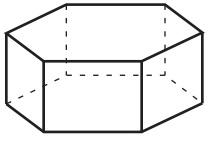
$V = s^3$
$SA = 6s^2$

Cilindro



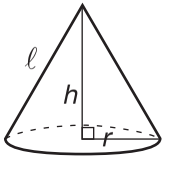
$V = Bh$
$SA = 2\pi r^2 + 2\pi rh$
o la suma del área de las bases + el área de superficie lateral

Prisma Recto



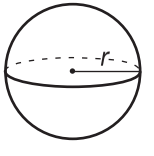
$V = Bh$
$SA = 2B + Ph$

Cono



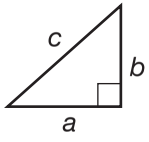
$V = \frac{1}{3}\pi r^2 h$
$SA = \pi r\ell + \pi r^2$

Esfera



$V = \frac{4}{3}\pi r^3$
$SA = 4\pi r^2$

Teorema de Pitágoras

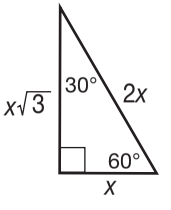


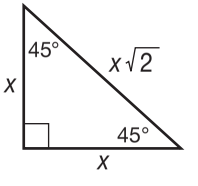
$a^2 + b^2 = c^2$

Clasificación de los Triángulos
$c^2 > a^2 + b^2 \rightarrow$ Triángulo Obtusángulo
$c^2 < a^2 + b^2 \rightarrow$ Triángulo Acutángulo
$c^2 = a^2 + b^2 \rightarrow$ Triángulo Rectángulo

Dónde C es el lado más largo del triangulo

Triángulos Rectángulos Especiales





Razones y Fórmulas Trigonométricas

$\sin\theta = \frac{\text{opp}}{\text{hyp}}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}}$

$\tan\theta = \frac{\text{opp}}{\text{adj}}$