Basic Geometry Equations Cheat Sheet

1. 2D Geometry: Plane Shapes

(a) Perimeter and Area

- Square:
  - Perimeter: P = 4s
  - Area: A = s^2
- Rectangle:
  - Perimeter: P = 2(l + w)
  - Area: A = lw
- Triangle:
  - Perimeter: P = a + b + c
  - Area: A = (1/2) * b * h
- Circle:
  - Circumference: C = 2pir
  - Area: A = pir^2
- Trapezoid:
  - Area: A = (1/2) * (b1 + b2) * h

(b) Triangle Properties

- Pythagorean Theorem: a^2 + b^2 = c^2
- Law of Sines: (a/sinA) = (b/sinB) = (c/sinC)
- Law of Cosines: c^2 = a^2 + b^2 - 2ab cosC

2. 3D Geometry: Solid Shapes

(a) Surface Area and Volume

- Cube:
  - Surface Area: SA = 6s^2
  - Volume: V = s^3
- Rectangular Prism:

  - Surface Area: SA = 2(lw + lh + wh)
  - Volume: V = lwh
- Sphere:
  - Surface Area: SA = 4pir^2
  - Volume: V = (4/3)pir^3
- Cylinder:
  - Surface Area: SA = 2pirh + 2pir^2
  - Volume: V = pir^2h
- Cone:
  - Surface Area: SA = pirl + pir^2
  - Volume: V = (1/3)pir^2h
- Pyramid:
  - Surface Area: SA = B + (1/2)Pl
  - Volume: V = (1/3)Bh

Where:

  - s = side length
  - l, w, h = length, width, height
  - r = radius
  - b1, b2 = bases of a trapezoid
  - B = base area of a solid
  - P = perimeter of the base
  - l = slant height