

Formula Sheet

Oliver Wyman Numerical Reasoning Test

Geometry

Triangles

$$x + y + z = 180^\circ \text{ (interior angles)}$$

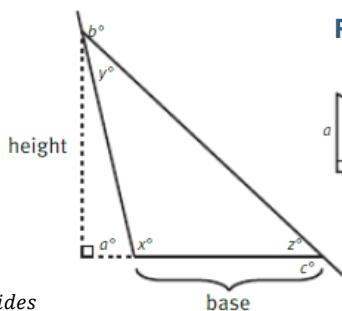
$$a + b + c = 360^\circ \text{ (exterior angles)}$$

$$a = y + z; b = x + z; c = x + y$$

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

Sum of any two sides > third side

Third side > difference of any two sides

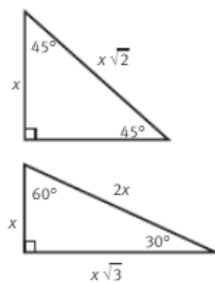


Right Triangles

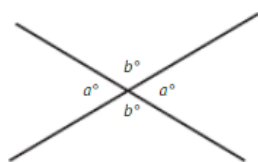
Side Ratios
(Pythagorean Triples)

3:4:5
5:12:13
7:24:25
8:15:17
9:40:41

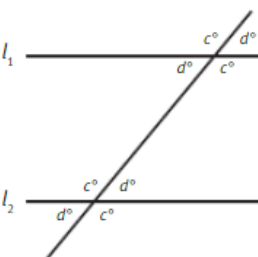
$$a^2 + b^2 = c^2$$



Angles

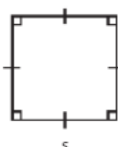


$$a + b = 180$$



$$l_1 \parallel l_2$$

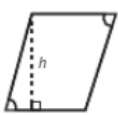
Quadrilateral *Sum of interior angles = 360°*



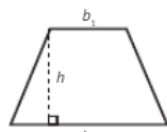
$$A = s^2$$



$$A = lw$$

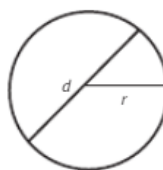


$$A = bh$$



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

Circles

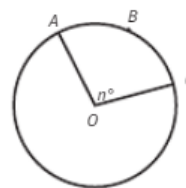


$$d = 2r$$

$$c = 2\pi r \text{ or } \pi d$$

$$A = \pi r^2$$

$$360^\circ \text{ around}$$



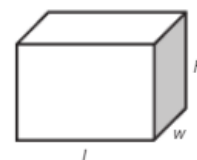
$$\frac{n}{360} = \frac{\text{Arc } ABC}{\text{Circum.}} = \frac{\text{Area of sector } OABC}{\text{Area of circle } O}$$

Uniform Solids



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

$$SA = 2\pi r^2 + 2\pi rh$$



$$V = lwh$$

$$SA = 2(lw + lh + wh)$$

Other Formulas

Quadratic Formula

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\% \text{ Increase} = \frac{\text{New Amount} - \text{Original Amount}}{\text{Original Amount}} \times 100\%$$

$$\% \text{ Decrease} = \frac{\text{Original Amount} - \text{New Amount}}{\text{Original Amount}} \times 100\%$$

Finance

$$\text{CAGR} = \left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\left(\frac{1}{\text{number of years}} \right)} - 1$$

$$\text{Present Value} = \frac{FV}{(1+i)^n}$$

$$\text{Profit Margin Ratio} = \frac{\text{Net Income}}{\text{Net Sales}}$$

Permutations

Number of permutations of n objects taken r at a time

$$P(n, r) = \frac{n!}{(n-r)!}$$

Probability

Rule of Addition

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Conditional Probability

$$P(A|B) = P(A \cap B) / P(B)$$

Bayes Formula

$$P(A|B) = P(B|A) \times P(A) / P(B)$$

Disjoint Events

Events A and B are disjoint if $P(A \cap B) = 0$

Independent Events

Events A and B are independent if $P(A \cap B) = P(A) \times P(B)$