

Formula Sheet – Pre-Calculus 10

Trigonometry

Calculator must be in DEGREE mode

Right Triangles

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

Right Triangle Ratios

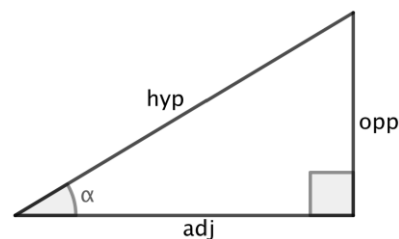
$$\sin \theta = \frac{o}{h}$$

$$\cos \theta = \frac{a}{h}$$

$$\tan \theta = \frac{o}{a}$$

$$\text{area} = \frac{1}{2}bh$$

SOH-CAH-TOA



Arithmetic Sequences & Linear Functions

Arithmetic Sequences

$$t_n = t_1 + d(n - 1)$$

$$S_n = \frac{n(t_1 + t_n)}{2}$$

$$S_n = \frac{n(2t_1 + d(n - 1))}{2}$$

Calculating Slope

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

y-intercept Form

$$y = mx + b$$

Sketching Method:

- Identify the slope m and the y-intercept b .
- Plot the y-intercept at $(0, b)$.
- Use the slope $m = \frac{\text{rise}}{\text{run}}$ to plot a second point.
- Draw the line through the points.

Slope-Point Form

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

Sketching Method:

- Identify the point (x_1, y_1) and the slope m .
- Plot the point on the graph.
- Use the slope $m = \frac{\text{rise}}{\text{run}}$ to plot a second point.
- Draw the line through the points.

General Form

$$Ax + By = C$$

Sketching Method:

- Find the y-intercept: set $x = 0$ and calculate y .
- Find the x-intercept: set $y = 0$ and solve for x .
- Plot both intercepts.
- Draw the line connecting them

Exponents

Radical Properties

$$\sqrt{ab} = \sqrt{a}\sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$a\sqrt{b} = \sqrt{a^2b}$$

Laws of Exponents

$$a^x a^y = a^{x+y}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$a^y b^y = (ab)^y$$

Interest

$$I = Prt$$

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

Quadratic Functions

General Form

$$y = ax^2 + bx + c$$

Sketching Method

- Find the **axis of symmetry** using $x = -\frac{b}{2a}$
- Find the **vertex** by substituting the axis of symmetry value into the equation.
- Find the **y-intercept**: set $x = 0$ and calculate.

Factored Form

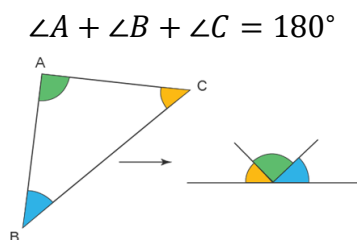
$$y = a(x - r_1)(x - r_2)$$

Sketching Method

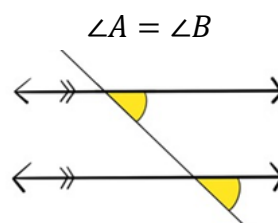
- Identify the **x-intercepts** by solving for x in each of the binomials.
- Find the **axis of symmetry** by averaging the intercepts, the middle of the x-intercepts.
- Find the **vertex** by substituting the axis of symmetry value into the equation.

Common Angle Relationships

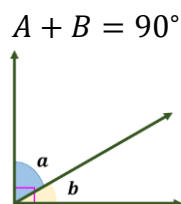
Triangle Angle Sum



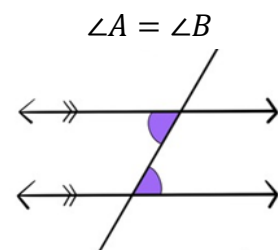
Corresponding Angles



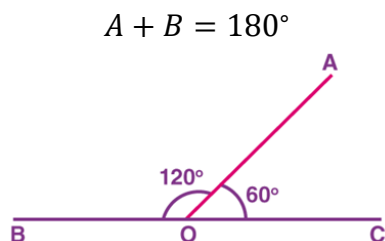
Complementary Angles



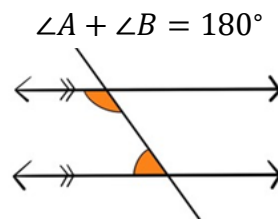
Alternate Interior Angles



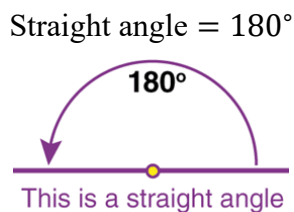
Supplementary Angles



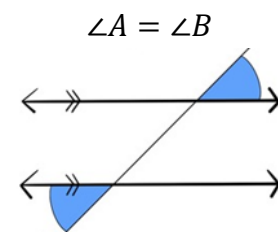
Co-Interior Angles



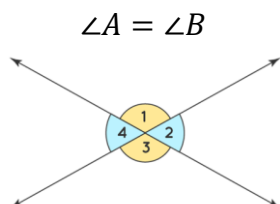
Straight Angles



Alternate Exterior Angles



Vertically Opposite Angles



Co-Exterior Angles

