

Directions: Fold along the dotted line. Place a sheet of paper under this sheet. Check your answers by unfolding the paper. Repeat as often as needed.

**Pythagoras:** In a triangle  $\triangle ABC$  with  $\angle A = 90^\circ$

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

Given  $P_1(x_1, y_1)$ ,  $P_2(x_2, y_2)$ , state

**Length Formula:**

$$|P_1P_2| =$$

$$\sqrt{\Delta x^2 + \Delta y^2} \text{ or } \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

**Midpoint Formula**

Midpoint of  $P_1P_2 =$

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

**Slope**

Slope of  $P_1P_2 =$

$$\frac{\Delta y}{\Delta x} \text{ or } \frac{y_2 - y_1}{x_2 - x_1}$$

**Parallel Lines**

Parallel lines have

equal slopes.

**Perpendicular Lines** Perpendicular lines have

slopes that are negative

reciprocals OR  $m_1 \times m_2 = -1$

**Slope y-intercept Formula**

The equation of a line with slope  $m$  and y-intercept  $b$  is

$$y = mx + b$$

**Circle**

The equation of a circle with centre  $(0,0)$  and radius  $r$

$$x^2 + y^2 = r^2$$

**Quadratic Relation with  $a \neq 0$**

Parabola with vertex  $(h,k)$

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

Parabola with  $x$ -intercepts  $r$  and  $s$

$$y = a(x - r)(x - s)$$

Parabola in standard form

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

**Quadratic Formula:** If  $ax^2 + bx + c = 0$  then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Trigonometry**

**Similar Triangle Ratios**

If  $\triangle ABC \sim \triangle PQR$  then

$$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$$

In a **right triangle**, with reference angle  $\angle A$

(SOHCAHTOA)

$$\sin A = \frac{\text{opp}}{\text{hyp}} \quad \cos A = \frac{\text{adj}}{\text{hyp}} \quad \tan A = \frac{\text{opp}}{\text{adj}}$$

**SINE LAW**

In any  $\triangle ABC$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

**COSINE LAW**

In any  $\triangle ABC$

$$a^2 = b^2 + c^2 - 2bc \cos A$$