



## Conic Sections Review

	TYPE	GEN. FORMULA	CENTRE	RADIUS	DISSIMILAR FORMULA	DISSIMILAR FORMULA		
CIRCLE		$(x - h)^2 + (y - k)^2 = r^2$	$(h, k)$	$r$			$P_1, P_2 = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	
ELLIPSE		$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	$(0, 0)$	$(a, 0), (-a, 0)$	$(c, 0), (-c, 0)$		$PF_1 + PF_2 = 2a$ $c^2 = a^2 - b^2$ $2a = \text{major axis} = \text{longer axis}$ $2b = \text{minor axis} = \text{shorter axis}$ $a > b > 0$	
		$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$	$(0, 0)$	$(0, a), (0, -a)$	$(0, c), (0, -c)$			
		$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$	$(h, k)$	$(h + a, k), (h - a, k)$	$(h + c, k), (h - c, k)$			
		$\frac{(x - h)^2}{b^2} + \frac{(y - k)^2}{a^2} = 1$	$(h, k)$	$(h, k + a), (h, k - a)$	$(h, k + c), (h, k - c)$			
PARABOLA	TYPE	GEN. FORMULA	VERTEX	DIRECTRIX	FOCUS	LINE OF SYMMETRY	RELATIONSHIPS	
		$x^2 = 4py$	$(0, 0)$	$y = -p$	$(0, p)$	$x = 0$	$\begin{cases} \text{if } p > 0 \\ \text{if } p < 0 \end{cases}$	
		$y^2 = 4px$	$(0, 0)$	$x = -p$	$(p, 0)$	$y = 0$	$\begin{cases} \text{if } p > 0 \\ \text{if } p < 0 \end{cases}$	
		$(x - h)^2 = 4p(y - k)$	$(h, k)$	$y = -p + k$	$(h, p + k)$	$x = h$	$\begin{cases} \text{if } p > 0 \\ \text{if } p < 0 \end{cases}$	
	$(y - k)^2 = 4p(x - h)$	$(h, k)$	$x = -p + h$	$(p + h, k)$	$y = k$	$\begin{cases} \text{if } p > 0 \\ \text{if } p < 0 \end{cases}$		
HYPERBOLA	TYPE	GEN. FORMULA	CENTRE	ASYMPTOTES	FOCUS	LINE OF SYMMETRY	VERTICES	RELATIONSHIPS
		$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$	$(0, 0)$	$y = \pm \frac{b}{a}x$	$(c, 0), (-c, 0)$	$y = 0$	$(a, 0), (-a, 0)$	$PF_1 - PF_2 = 2a$ $c^2 = a^2 + b^2$
		$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$	$(0, 0)$	$y = \pm \frac{a}{b}x$	$(0, c), (0, -c)$	$x = 0$	$(0, a), (0, -a)$	$PF_1 - PF_2 = 2a$ $c^2 = a^2 + b^2$
		$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$	$(h, k)$	$y - k = \pm \frac{b}{a}(x - h)$	$(h + c, k), (h - c, k)$	$y = k$	$(h + a, k), (h - a, k)$	$PF_1 - PF_2 = 2a$ $c^2 = a^2 + b^2$
	$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$	$(h, k)$	$y - k = \pm \frac{a}{b}(x - h)$	$(h, k + c), (h, k - c)$	$x = h$	$(h, k + a), (h, k - a)$	$PF_1 - PF_2 = 2a$ $c^2 = a^2 + b^2$	