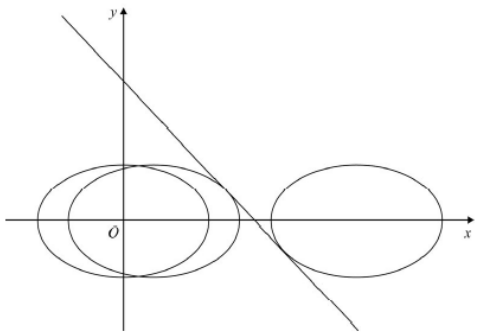
FP1 Conics Answers

8(a)	Good attempt at sketch	M1		
	Correct at origin	A1	2	
(b)(i)	y replaced by $y - 2$	B1		
	Equation is $(y-2)^2 = 12x$	B1√	2	ft $y + 2$ for $y - 2$
(ii)	Equation is $x^2 = 12y$	B1	1	
(c)(i)	$(x+c)^2 = x^2 + 2cx + c^2$	B1		
	$\ldots = 12x$	M1		
	Hence result	A1	3	convincingly shown (AG)
(ii)	Tangent if $(2c-12)^2 - 4c^2 = 0$	M1		
	ie if $-48c + 144 = 0$ so $c = 3$	A1	2	
(iii)	$x^2 - 6x + 9 = 0$	M1		
	$x = 3, y = 6$	A1	2	
(iv)	$c = 4 \Rightarrow$ discriminant $= -48 < 0$	M1A1		OE
	So line does not intersect curve	A1	3	
	Total		**15**	

7(a)	Stretch parallel to y axis ...	B1		
	... scale-factor $\frac{1}{2}$ parallel to y axis	B1	2	
(b)	$(x-2)^2 - y^2 = 1$	M1A1		
	Translation in x direction ...	A1		
	... 2 units in positive x direction	A1	4	
	Total		**6**	

8(a)	$x = 10 \Rightarrow 4 - \frac{y^2}{9} = 1$	M1		
	$\Rightarrow y^2 = 27$	A1		PI
	$\Rightarrow y = \pm 3\sqrt{3}$	A1	3	
(b)	One branch generally correct	B1		Asymptotes not needed
	Both branches correct	B1		With implied asymptotes
	Intersections at $(\pm 5, 0)$	B1	3	
(c)	Required tangent is $x = 5$	B1F	1	ft wrong value in (b)
(d)(i)	y correctly eliminated	M1		
	Fractions correctly cleared	m1		
	$16x^2 - 200x + 625 = 0$	A1	3	convincingly shown (**AG**)
(ii)	$x = \frac{25}{4}$	B1		No need to mention repeated root, but B0 if other values given as well
	Equal roots $\Rightarrow$ tangency	E1	2	Accept 'It's a tangent'
	Total		**12**	

9(a)	Intersections $\left(\pm\sqrt{2}, 0\right)$, $(0, \pm 1)$	B1B1	2	Allow B1 for $\left(\sqrt{2}, 0\right)$, $(0, 1)$
(b)	Equation is $\dfrac{(x-k)^2}{2} + y^2 = 1$	M1A1	2	M1 if only one small error, eg $x + k$ for $x - k$
(c)	Correct elimination of y Correct expansion of squares Correct removal of denominator Answer convincingly established	M1 M1 M1 A1	4	AG
(d)	Tgt $\Rightarrow 4(k+4)^2 - 12(k^2+6) = 0$ ... $\Rightarrow k^2 - 4k + 1 = 0$ ... $\Rightarrow k = 2 \pm \sqrt{3}$	M1 m1A1 A1	4	OE
(e)		B1 B2	3	Curve to left of line Curve to right of line Curves must touch the line in approx correct positions SC 1/3 if both curves are incomplete but touch the line correctly
	Total		**15**	