Question	Answer	Marks	Partial Marks
1	$x=3$	**B1**	
	$2-3x=4+x$ oe	**M1**	
	$x=-0.5$ oe	**A1**	
2	$x^2+3x\left(\frac{4-2x}{5}\right)=4$	**M1**	eliminate x or y
	$x^2-12x+20 \quad (=0)$	**A1**	3 terms on one side if eliminating y $5y^2+16y \quad (=0)$ if eliminating x
	$(x-2)(x-10) \quad (=0)$	**M1**	or $y(5y+16) \quad (=0)$
	$x=2$ or $x=10$ nfww	**A1**	or correct pair
	$y=0$ or $y=-\frac{16}{5}$ nfww	**A1**	
3	$(k+9)^2-4\times9 \ (>0)$	**M1**	use b^2-4ac
	$k^2+18k+45 \quad (>0)$	**A1**	
	$k=-15 \quad k=-3$	**A1**	
	$k<-15$ or $k>-3$ no isw mark final answer	**A1**	not 'and' A0 if combined as one statement
4(a)	$\frac{dy}{dx}=\frac{1}{1+\sin x}$	**M1**	
	$\times\cos x=\frac{\cos x}{1+\sin x}$	**A1**	
4(b)	insert $\frac{\pi}{6}$ into *their* $\frac{dy}{dx}$	**M1**	
	$\frac{1}{\sqrt{3}}$	**A1**	not $\frac{\sqrt{3}}{3}$

Question	Answer	Marks	Partial Marks
4(c)	$their \frac{\cos x}{1+\sin x} = \frac{\sin x}{\cos x}$	**M1**	replace $\tan x$ with $\frac{\sin x}{\cos x}$
	use $\cos^2 x = 1 - \sin^2 x$ $\left(2\sin^2 x + \sin x - 1 = 0\right)$	**M1**	earned when equation reduced to a quadratic in sin*x*
	$(2\sin x - 1)(\sin x + 1) = 0$	**M1**	solve three term quadratic in sin*x*
	$x = \frac{\pi}{6}$	**A1**	or 0.524 or better radians only if M0 M0 M0 and (a) and (b) correct, allow SC2 for tan*x* = $\frac{1}{\sqrt{3}}$, $x = \frac{\pi}{6}$
	$x = \frac{5\pi}{6}$	**A1**	or 2.62 or better radians only A0 if extra solution(s) in range
5	express an equation correctly in powers of 3 or powers of 2	**M1**	
	$x + 2y - 2 = 5$ oe $(x + 2y = 7)$	**A1**	accept unsimpified
	$2x + 1 - 2.5 = 3 + y - 0.5$ oe $(2x - y = 4)$	**A1**	accept unsimplified
	solve correct equations for *x* or *y*	**M1**	
	$x = 3$ and $y = 2$	**A1**	
6(a)	3024	**B1**	
6(b)	24	**B1**	
6(c)	${}^4P_2 \times {}^5P_2$	**M1**	4×3 × 5×4
	240 no isw	**A1**	
6(d)	${}^4P_1 \times {}^8P_3$	**M1**	4 × 8×7×6
	1344 no isw	**A1**	
7(a)	$-x\sin x + \cos x$ isw	**B2**	accept unsimplified if incorrect allow B1 for $\frac{d}{dx}(\cos x) = -\sin x$ clearly seen