7	(a)		**DR**			
			$x^2 + (mx)^2 - 6x - 2mx + 5 = 0$	**M1**	**1.1**	Substitute $y = mx$ into the other equation, in original form or rearranged form even if incorrectly rearranged
			$(1 + m^2)\,x^2 - (6 + 2m)x + 5 = 0$ (I)			
			$(6 + 2m)^2 - 20(1 + m^2)$ (≥ 0)	**M1**	**3.1a**	Attempt find Δ. ft their equation
			$\Delta = -16m^2 + 24m + 16$ (≥ 0)	**M1**	**1.1**	Attempt rearrange Δ as a quadratic expression in m
			Roots of $-16m^2 + 24m + 16 = 0$ are $m = 2$ and $m = -\frac{1}{2}$	**A1**	**1.1**	or critical values are 2 and $-\frac{1}{2}$ cao
			Range for real solutions is $-\frac{1}{2} \leq m \leq 2$	**A1**	**2.2a**	cao Not "<"
				[5]		

Question			Answer	Marks	AO	Guidance
7	(b)		$m = 2 \Rightarrow x^2 + 4x^2 - 6x - 4x + 5 = 0$ $(\Rightarrow 5x^2 - 10x + 5 = 0)$	M1	1.1	Substitute $m = 2$ into their (I) or substitute $y = 2x$ into $x^2 + y^2 - 6x - 2y + 5 = 0$
			$x = 1$, & repeated root or only one root oe or $x = 1$, $x = 1$ NB May be implied by next line.	A1		
			Line is a tangent	A1	2.1	or "Only one intersection point" oe dep M1 only
			Alternative method 1 $m = 2$ gives $\Delta = -16\times2^2 + 24\times2 + 16$	M1		Substitute $m = 2$ into their Δ
			$= 0$. hence repeated root or only one root oe NB May be implied by next line.	A1		
			Line is a tangent	A1		or "Only one intersection point" oe
			Alternative method 2			NB Question allows for diagrammatic solution.
			Attempt draw circle centre (3, 1) and line through O	M1		
			Approximately correct diagram showing line touching circle	A1		
			State "Tangent" or "Only one intersection point" oe	A1		Dep M1A1
				[3]		.