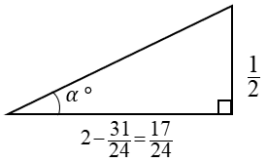
3a	Moment of S about the y-axis	M1	Use of formula $(\pi)(\rho)\int xy^2\,\mathrm{d}x$ No need to see the correct limits here. The curve equation must be substituted correctly and an attempt to integrate seen (at least one term must have a power of x raised by 1) Note the correct expression for integrating is $x\left(\frac{1}{4}x(3-x)\right)^2=\frac{1}{16}x^3(3-x)^2$ $=\frac{1}{16}\left(9x^3-6x^4+x^5\right)$
	$=(\pi)(\rho)\frac{1}{16}\left[\frac{9}{4}x^4-\frac{6}{5}x^5+\frac{1}{6}x^6\right]$	A1	Correct integrated expression.
	$=\frac{31}{60}(\pi)(\rho)$	A1	Correct use of correct limits (0 and 2). No need to see a line of working showing substitution of limits. However, must see $\frac{31}{60}$ or equivalent numerical evaluation of integral.
	$\bar{x}=\frac{\frac{31}{60}(\pi)(\rho)}{\frac{2}{5}(\pi)(\rho)}$	M1	Complete method to find the distance. Formula must be the right way up $\bar{x}=\frac{(\pi)(\rho)\int xy^2\,\mathrm{d}x}{M}$ Must have consistent use of π and of ρ.
	$=\frac{31}{24}$ *	A1*	Obtain given answer from correct working
		[5]	
3b	Correct use of trig  	M1	Correct trig ratio to find a relevant angle, $\alpha°$ or $(90-\alpha)°$ Must use curve equation with $x = 2$ and $\left(2-\frac{31}{24}\right)$
	$\tan\alpha°=\frac{1}{2}\div\frac{17}{24}\left(=\frac{12}{17}\right)$	A1	Or equivalent. Condone reciprocal.
	$\alpha=35$	A1	2 sf or better (35.2175…) A0 for use of radians.
		[3]	
		(8)	