Inverse trigonometric functions in calculus

Answers

Further Maths topic practice

This topic online

Q	Answer	Marks
1	**a)** $4/\sqrt{(1 - 16x^2)}$ **b)** $3x^2/(1 + x^6)$	3
2	**a)** $(1/5)\arctan(x/5) + c$ **b)** $3\arcsin(x/2) + c$	3
3	**a)** shown **b)** $-9x/\sqrt{(1 - 9x^2)}$	5
4	**a)** $\sqrt{3}\pi/24$ **b)** $\pi/18$	6
5	**a)** $f'(x) = 2x \arctan x + 1$ **b)** $k = 2$	6
6	$a = 2$, $b = -3/16$	6
7	**a)** $9 - (x - 4)^2$ **b)** $\pi/6$	5
8	**a)** $2/(x + 1) + (x + 3)/(x^2 + 4)$ **b)** $p = 1/2$, $q = 162$, $r = 3/8$ (equivalently $\ln(9\sqrt{2}) + 3\pi/8$)	8
9	**a)** $(1/2, \pi/4 - 1/2)$ and $(-1/2, 1/2 - \pi/4)$ **b)** $(1/2, \pi/4 - 1/2)$ is a maximum; $(-1/2, 1/2 - \pi/4)$ is a minimum	7
10	$k = -1/6$, $P = (0, -\sqrt{3}/6)$	6
11	**a)** shown **b)** $\pi/12$ **c)** $dy/dx = 9e^x/(9 - e^{2x})^{3/2} > 0$, so it is never zero	9
12	**a)** shown **b)** $\sqrt{10}$ **c)** $d\theta/dx$ changes from positive to negative, so a maximum; 25.4° **d)** Visitors have different eye levels, or the eye is treated as a point	10

Full worked solutions, written out by hand, are on the solutions sheet for this topic.

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