

Q	Marking Instructions	AO	Marks	Typical Solution
12	Finds the difference between the maximum and minimum values of y	AO3.1b	M1	$x^2 + 2xy + 2y^2 = 10$ $2x + 2y + 2x \frac{dy}{dx} + 4y \frac{dy}{dx} = 0$ <p>Highest and lowest points occur when $\frac{dy}{dx} = 0$</p> $\frac{dy}{dx} = 0 \Rightarrow x = -y$ $y^2 - 2y^2 + 2y^2 = 10$ $y = \pm\sqrt{10}$ $\therefore \text{Height} = \sqrt{10} - (-\sqrt{10})$ $= 2\sqrt{10} = 6.32 \text{ m}$
	Uses implicit differentiation	AO1.1a	M1	
	Differentiates correctly	AO1.1b	A1	
	States stationary points occur when $\frac{dy}{dx} = 0$	AO2.4	R1	
	Uses $\frac{dy}{dx} = 0$ to find x in terms of y (or vice versa)	AO1.1a	M1	
	Finds $x = -y$	AO1.1b	A1	
	Deduces maximum and minimum values of y FT 'their' expression provided all M1 marks have been awarded	AO2.2a	A1F	
	States the height of the sculpture above the platform FT 'their' max and min values for y provided all M1 marks have been awarded	AO2.2a	A1F	
Total			8	