Question	Scheme	Marks	AOs
13(a)	For a correct equation in p or q $p = 10^{4.8}$ or $q = 10^{0.05}$	M1	1.1b

	For $p = $ awrt 63100 or $q = $ awrt 1.122	A1	1.1b
	For correct equations in p and q $\quad p = 10^{4.8}$ and $q = 10^{0.05}$	dM1	3.1a
	For $p = $ awrt 63100 and $q = $ awrt 1.122	A1	1.1b
		(4)	
(b)	(i) The value of the painting on 1st January 1980	B1	3.4
	(ii) The proportional increase in value each year	B1	3.4
		(2)	
(c)	Uses $V = 63100 \times 1.122^{30}$ or $\log V = 0.05 \times 30 + 4.8$ leading to $V = $	M1	3.4
	$= $ awrt $(£) 2000000$	A1	1.1b
		(2)	
		(8 marks)	

Notes

(a)

M1: For a correct equation in p or q $\quad$ This is usually $p = 10^{4.8}$ or $q = 10^{0.05}$ but may be $\log q = 0.05$ or $\log p = 4.8$

A1: For $p = $ awrt 63100 or $q = $ awrt 1.122

M1: For linking the two equations and forming correct equations in p and q. This is usually $p = 10^{4.8}$ and $q = 10^{0.05}$ but may be $\log q = 0.05$ and $\log p = 4.8$

A1: For $p = $ awrt 63100 and $q = $ awrt 1.122 $\quad$ Both these values implies M1 M1

....

ALT I(a)

M1: Substitutes $t = 0$ and states that $\log p = 4.8$

A1: $p = $ awrt 63100

M1: Uses their found value of p and another value of t to find form an equation in q

A1: $p = $ awrt 63100 and $q = $ awrt 1.122

....

(b)(i)

B1: The value of the painting on 1st January 1980 (is £63 100)

Accept the original value/cost of the painting or the initial value/cost of the painting

(b)(ii)

B1: The proportional increase in value each year. Eg Accept an explanation that explains that the value of the painting will rise 12.2% a year. (Follow through on their value of q.)

Accept "the rate" by which the value is rising/price is changing. "1.122 is the decimal multiplier representing the year on year increase in value"

Do not accept "the amount" by which it is rising or "how much" it is rising by

If they are not labelled (b)(i) and (b)(ii) mark in the order given but accept any way around as long as clearly labelled " p is............ " and " q is ...."

(c)

M1: For substituting $t = 30$ into $V = pq^t$ using their values for p and q or substituting $t = 30$ into $\log_{10} V = 0.05t + 4.8$ and proceeds to V

A1: For awrt either £1.99 million or £2.00 million. Condone the omission of the £ sign. Remember to isw after a correct answer