

1.3 Answers

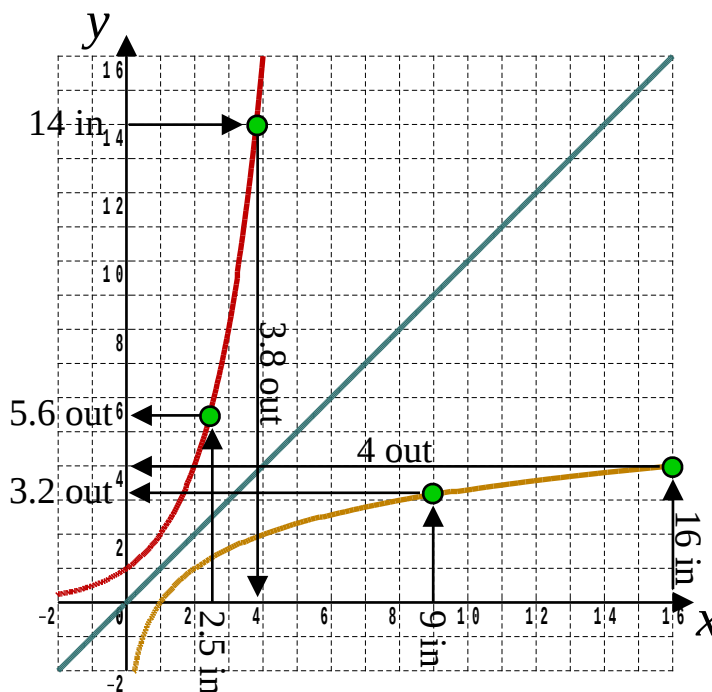
A-Level Pure Mathematics : Year 1 Exponentials and Logarithms

1.3.1 Solutions to 1.1 An Exponential Curve and its Inverse

(i)

x	-2	-1	0	1	2	3	4
y	0.25	0.5	1	2	4	8	16

[2 marks]



(ii) The red curve on the graph is plotted; $y = 2^x$

[2 marks]

(iii) 2.5 in gives 5.7 out on the red curve, $\therefore 2^{2.5} = 2.7$

[2 marks]

(iv) $2^x = 14$, 14 in gives 3.8 out on the red curve, $\therefore x = 3.8$

[2 marks]

(v) Line $y = x$ plotted accurately (in blue on the graph)

[1 mark]

(vi) Reflected curve plotted accurately (in gold on the graph)

[2 marks]

(vii) 9 in gives 3.2 out on the gold curve, $\therefore \log_2 9 = 3.2$

[2 marks]

(viii) 16 in gives 4 out on the gold curve, $\therefore \log_2 16 = 4$

[2 marks]

(ix) $\log_2 64 = 6$

[1 mark]

1.3.2 Solutions to 1.2 Exercise

Answer 1

(i) 4 (ii) 5 (iii) 6 (iv) 3

[4 marks]

Answer 2

(i) -2 (ii) -3 (iii) -2 (iv) -3

[4 marks]

Answer 3

(i) 5 (ii) 3 (iii) 8 (iv) 81

[4 marks]

Answer 4

(i) 8 (ii) 100000

(iii) $\frac{1}{8}$ (or 0.125) (iv) 27

[4 marks]

Answer 5

(i) 4 (ii) 8 (iii) 1

(iv) -3 (v) -2 (vi) 0.5

(vii) 0 (viii) $\frac{1}{3}$ (ix) -3

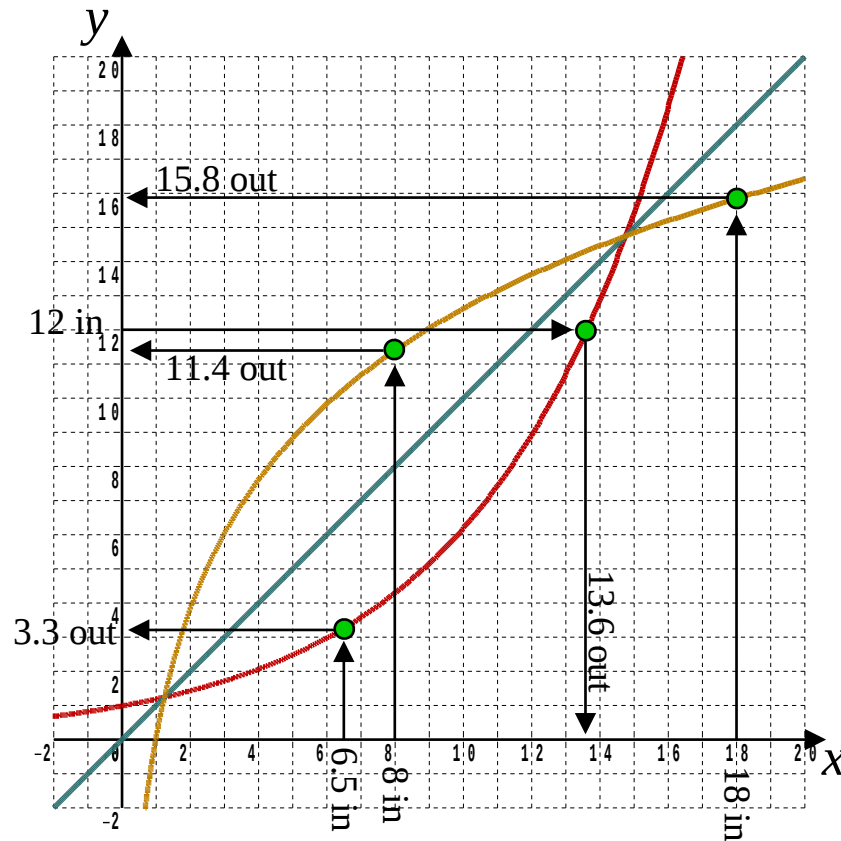
[9 marks]

Answer 6

(i)

x	-2	-1	0	1	2	3	4	5	6	7	8	12	16
y	0.7	0.8	1	1.2	1.4	1.7	2.1	2.5	3.0	3.6	4.3	8.9	18.5

[2 marks]



- (ii) The red curve on the graph is plotted; $y = 1.2^x$ [2 marks]
- (iii) 6.5 in gives 3. out on the red curve, $\therefore 1.2^{6.5} = 3.3$ [2 marks]
- (iv) $1.2^x = 12$, 12 in gives 13.6 out on the red curve, $\therefore x = 13.6$ [2 marks]
- (v) Line $y = x$ plotted accurately (in blue) [1 mark]
- (vi) Reflected curve plotted accurately (in gold) [2 marks]
- (vii) 8 in gives 11.4 out on the gold curve, $\therefore \log_{1.2} 8 = 11.4$ [2 marks]
- (viii) 18 in gives 15.8 out on the gold curve, $\therefore \log_{1.2} 18 = 15.8$ [2 marks]