
Logarithms - Past Edexcel Exam Questions

1. Find, giving your answer to 3 significant figures where appropriate, the value of x for which

(a) $3^x = 5$. [3]

(b) $\log_2(2x + 1) - \log_2(x) = 2$. [4]

Question 3 - Jan 2005

2. Solve

(a) $5^x = 8$, giving your answer to 3 significant figures, [3]

(b) $\log_2(x + 1) - \log_2(x) = \log_2(7)$. [3]

Question 2 - Jun 2005

3. (a) Write down the value of $\log_6(36)$. [1]

(b) Express $2\log_a(3) + \log_a(11)$ as a single logarithm to the base a . [3]

Question 3 - May 2006

4. Solve the equation

$$5^x = 17,$$

giving your answer to 3 significant figures. [5]

Question 4 - Jan 2007

5. (a) Find, to 3 significant figures, the value of x for which $8^x = 0.8$. [2]

(b) Solve the equation

$$2\log_3 x - \log_3 7x = 1$$

[4]

Question 6 - May 2007

6. Given that a and b are positive constants, solve the simultaneous questions

$$\begin{aligned}a &= 3b, \\ \log_3 a + \log_3 b &= 2\end{aligned}$$

Give your answers as exact numbers.

[6]

Question 5 - Jan 2008

7. (a) Find, to 3 significant figures, the value of x for which $5^x = 7$. [2]

- (b) Solve the equation

$$5^{2x} - 12(5^x) + 35 = 0$$

[4]

Question 4 - Jun 2008

8. Given that $0 < x < 4$ and

$$\log_5(4 - x) - 2\log_5 x = 1,$$

find the value of x .

[6]

Question 4 - Jan 2009

9. (a) Find the value of y such that

$$\log_2 y = -3$$

[2]

- (b) Find the values of x such that

$$\frac{\log_2 32 + \log_2 16}{\log_2 x} = \log_2 x$$

[5]

Question 8 - June 2009

10. (a) Find the positive value of x such that

$$\log_x 64 = 2.$$

[2]

(b) Solve for x

$$\log_2(11 - 6x) = 2\log_2(x - 1) + 3$$

[6]

Question 5 - Jan 2010

11. (a) Given that

$$2\log_3(x - 5) - \log_3(2x - 13) = 1,$$

show that $x^2 - 16x + 64 = 0$.

[5]

(b) Hence, or otherwise, solve $2\log_3(x - 5) - \log_3(2x - 13) = 1$.

[2]

Question 7 - Jun 2010

12. (a) Sketch the graph of $y = 7^x$, $x \in \mathbb{R}$, showing the coordinates of any points at which the graph crosses the axes.

[2]

(b) Solve the equation

$$7^{2x} - 4(7^x) + 3 = 0,$$

giving the answer to 2 decimal places where appropriate.

[6]

Question 8 - Jan 2011

13. Find, giving your answer to 3 significant figures where appropriate, the value of x for which

(a) $5^x = 10$,

[2]

(b) $\log_3(x - 2) = -1$.

[2]

Question 3 - May 2011

14. Given that $y = 3x^2$,

(a) show that $\log_3 y = 1 + 2\log_3 x$. [3]

(b) Hence, or otherwise, solve the equation

$$1 + 2\log_3 x = \log_3(28x - 9).$$

[3]

Question 4 - Jan 2012

15. Find the values of x such that

$$2\log_3 x - \log_3(x - 2) = 2$$

[5]

Question 2 - May 2012

16. Given that $2\log_2(x + 15) - \log_2 x = 6$,

(a) show that $x^2 - 34x + 225 = 0$. [5]

(b) Hence, or otherwise, solve the equation $2\log_2(x + 15) - \log_2 x = 6$. [2]

Question 6 - Jan 2013

17. (a) Find the exact value of x for which

$$\log_2(2x) = \log_2(5x + 4) - 3$$

[4]

(b) Given that

$$\log_a y + 3\log_a 2 = 5,$$

express y in terms of a .

Give your answer in its simplest form. [3]

Question 7 - May 2013

18. (a) Sketch the graph of

$$y = 3^x, \quad x \in \mathbb{R}$$

showing the coordinates of any points at which the graph crosses the axes. [2]

- (b) Use algebra to solve the equation

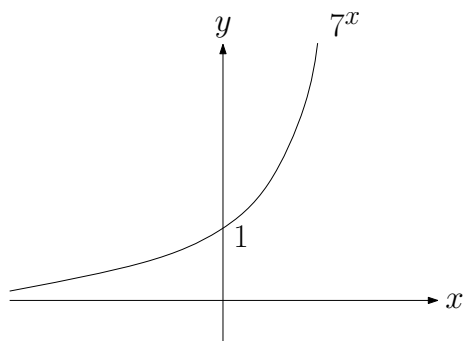
$$3^{2x} - 9(3^x) + 18 = 0$$

giving your answers to 2 decimal places where appropriate. [5]

Question 8 - May 2014

Solutions

1. (a) $x = 1.46$
 (b) $x = \frac{1}{2}$
2. (a) $x = 1.29$
 (b) $x = \frac{1}{6}$
3. (a) 2
 (b) $\log_a 99$
4. $x = 1.76$
5. (a) -0.107
 (b) $x = 21$
6. $a = 3\sqrt{3}$, $b = \sqrt{3}$
7. (a) 1.21
 (b) $x = 1$, $x = 1.21$
8. $x = \frac{4}{5}$
9. (a) $y = \frac{1}{8}$
 (b) $x = 8, \frac{1}{8}$
10. (a) $x = 8$
 (b) $x = \frac{3}{2}$
11. (a) -
 (b) $x = 8$
12. (a) .



(b) $x = 0, x = 0.56$

13. (a) 1.43

(b) $\frac{7}{3}$

14. (a) -

(b) $x = \frac{1}{3}, x = 9$

15. $x = 3, x = 6$

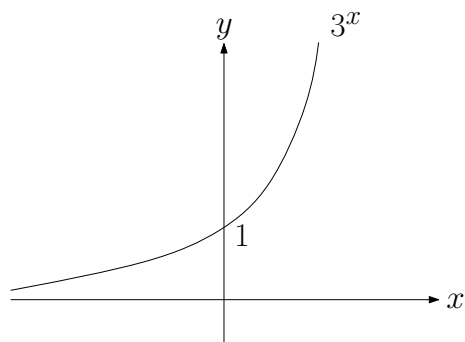
16. (a) -

(b) $x = 25, x = 9$

17. (a) $x = \frac{4}{11}$

(b) $y = \frac{a^5}{8}$

18. (a) .



(b) $x = 1, x = 1.63$