



Solving Equations using Logarithms 2 - Edexcel Past Exam Questions

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

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

(b) Hence, or otherwise, solve the equation

$$1 + 2 \log_3 x = \log_3 (28x - 9). \quad (3)$$

Jan 12 Q4

2. Find the values of x such that

$$2 \log_3 x - \log_3(x - 2) = 2 \quad (5)$$

June 12 Q2

3. 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)

Jan 13 Q6

4. $f(x) = 2x^3 - 5x^2 + ax + 18$

where a is a constant.

Given that $(x - 3)$ is a factor of $f(x)$,

(a) show that $a = -9$, (2)

(b) factorise $f(x)$ completely. (4)

Given that

$$g(y) = 2(3^{3y}) - 5(3^{2y}) - 9(3^y) + 18,$$

(c) find the values of y that satisfy $g(y) = 0$, giving your answers to 2 decimal places where appropriate. (3)

June 13 Q3



5. (i) Find the exact value of x for which

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

- (ii) Given that

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

express y in terms of a .

Give your answer in its simplest form.

(3)
June 13 Q7

6. Given that $\log_3 x = a$, find in terms of a ,

(a) $\log_3(9x)$ (2)

(b) $\log_3\left(\frac{x^5}{81}\right)$ (3)

giving each answer in its simplest form.

- (c) Solve, for x ,

$$\log_3(9x) + \log_3\left(\frac{x^5}{81}\right) = 3$$

giving your answer to 4 significant figures.

(4)
June(R) 13 Q6

7. (a) Sketch the graph of

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

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)

June 14 Q8



8. (i) Solve

$$5^y = 8$$

giving your answers to 3 significant figures. (2)

- (ii) Use algebra to find the values of x for which

$$\log_2(x+15) - 4 = \frac{1}{2} \log_2 x \quad (6)$$

June(R) 14 Q8

9. (i) Use logarithms to solve the equation $8^{2x+1} = 24$, giving your answer to 3 decimal places. (3)

- (ii) Find the values of y such that

$$\log_2(11y - 3) - \log_2 3 - 2 \log_2 y = 1, \quad y > \frac{3}{11}.$$

(6)

June 15 Q7

10. (i) Given that

$$\log_3(3b + 1) - \log_3(a - 2) = -1, \quad a > 2,$$

express b in terms of a . (3)

- (ii) Solve the equation

$$2^{2x+5} - 7(2^x) = 0,$$

giving your answer to 2 decimal places.

(Solutions based entirely on graphical or numerical methods are not acceptable.) (4)

June 16 Q8

11. (i) $2 \log(x + a) = \log(16a^6)$, where a is a positive constant

Find x in terms of a , giving your answer in its simplest form. (3)

- (ii) $\log_3(9y + b) - \log_3(2y - b) = 2$, where b is a positive constant

Find y in terms of b , giving your answer in its simplest form. (4)

June 17 Q7
