

P2 January 2002

Given that $p = \log_q 16$, express in terms of p ,

(a) $\log_q 2$,

(2)

(b) $\log_q (8q)$.

(4)

P2 January 2002

(a) Given that $3 + 2 \log_2 x = \log_2 y$, show that $y = 8x^2$.

(3)

(b) Hence, or otherwise, find the roots α and β , where $\alpha < \beta$, of the equation

$$3 + 2 \log_2 x = \log_2 (14x - 3).$$

(3)

(c) Show that $\log_2 \alpha = -2$.

(1)

(d) Calculate $\log_2 \beta$, giving your answer to 3 significant figures.

(3)

P2 January 2004

Given that $\log_2 x = a$, find, in terms of a , the simplest form of

(a) $\log_2 (16x)$,

(2)

(b) $\log_2 \left(\frac{x^4}{2} \right)$.

(3)

(c) Hence, or otherwise, solve

$$\log_2 (16x) - \log_2 \left(\frac{x^4}{2} \right) = \frac{1}{2},$$

giving your answer in its simplest surd form.

(4)

P2 June 2004

Given that $\log_5 x = a$ and $\log_5 y = b$, find in terms of a and b ,

(a) $\log_5 \left(\frac{x^2}{y} \right)$, (2)

(b) $\log_5(25x\sqrt{y})$. (3)

It is given that $\log_5 \left(\frac{x^2}{y} \right) = 1$ and that $\log_5(25x\sqrt{y}) = 1$.

(c) Form simultaneous equations in a and b . (1)

(d) Show that $a = -0.25$ and find the value of b . (2)

Using the value of a and b , or otherwise,

(e) calculate, to 3 decimal places, the value of x and the value of y . (3)

C2 January 2005

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)

C2 June 2005

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)

C2 June 2006

- (i) Write down the value of $\log_6 36$. (1)
- (ii) Express $2 \log_a 3 + \log_a 11$ as a single logarithm to base a . (3)

C2 June 2006

- (a) Sketch the graph of $y = 3^x$, $x \in \mathbb{R}$, showing the coordinates of the point at which the graph meets the y -axis. (2)

C2 January 2007

- Solve the equation $5^x = 17$, giving your answer to 3 significant figures. (3)

C2 June 2007

- (a) Find, to 3 significant figures, the value of x for which $8^x = 0.8$. (2)
- (b) Solve the equation

$$2 \log_3 x - \log_3 7x = 1. \quad (4)$$

C2 January 2008

Given that a and b are positive constants, solve the simultaneous equations

$$a = 3b,$$

$$\log_3 a + \log_3 b = 2.$$

Give your answers as exact numbers. (6)

C2 June 2008

- (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)

C2 January 2009

Given that $0 < x < 4$ and

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

find the value of x .

(6)

C2 June 2009

(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)

C2 January 2010

(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)

C2 June 2010

(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)

C2 January 2011

(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 your answers to 2 decimal places where appropriate.

(6)

C2 June 2011

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)

C2 January 2012

Given that $y = 3x^2$,

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

(3)

(b) Hence, or otherwise, solve the equation

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

(3)

C2 June 2012

Find the values of x such that

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

(5)

C2 January 2013

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 $2 \log_2(x + 15) - \log_2 x = 6$.

ANSWERS**C2 January 2005**

$$(a) x = 1.46 \quad (b) x = 0.5$$

C2 June 2005

$$(a) 1.29 \quad (b) \frac{1}{6}$$

C2 June 2006

$$(a) 2 \quad (b) \log_a 99$$

C2 January 2007

$$x = 1.76$$

C2 June 2007

$$(a) -0.107 \quad (b) x = 21$$

C2 January 2008

$$a = 3\sqrt{3}, \quad b = \sqrt{3}$$

C2 June 2008

$$(a) 1.21 \quad (b) x = 1$$

C2 January 2009

$$x = \frac{4}{5}$$

C2 June 2009

$$(a) y = \frac{1}{8} \quad \text{or} \quad 0.125 \quad (b) x = \frac{1}{8}$$

C2 January 2010

$$(a) x = 8 \quad (b) x = \frac{3}{2}$$

C2 June 2010

$$(b) x = 8$$

C2 January 2011

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

C2 June 2011

(a) 1.43 (b) $2^{\frac{1}{3}}$

C2 January 2012

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

C2 June 2012

$x = 3, x = 6$