Edexcel Maths C2

Topic Questions from Papers

Exponentials and Logarithms

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)

Leave blank

3. (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)

Q3

(Total 4 marks)

N 2 3 5 5 8 A 0 5 2 0

Leave blank

4. Solve the equation

$$5^x = 17,$$

giving your answer to 3 significant figures.

(3)

Q4

(Total 3 marks)

Leave
blank

6. (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)

Leave blank

5. 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)

4.   (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)

Leave
blank

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

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

   find the value of x.

(6)

Leave
blank

8. (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)

a
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5. (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)

7. (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)

8. (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)

3. 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)

Leave
blank

4. 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)

2. Find the values of x such that

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

(5)

6. 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)

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

    (a) $\log_3 (9x)$

    (2)

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

    (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)

Question 6 continued

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

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

(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)

Core Mathematics C2

Candidates sitting C2 may also require those formulae listed under Core Mathematics C1.

Cosine rule

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Binomial series

$$(a+b)^n = a^n + \binom{n}{1} a^{n-1}b + \binom{n}{2} a^{n-2}b^2 + \ldots + \binom{n}{r} a^{n-r}b^r + \ldots + b^n \quad (n \in \mathbb{N})$$

$$\text{where} \quad \binom{n}{r} = {}^nC_r = \frac{n!}{r!(n-r)!}$$

$$(1+x)^n = 1 + nx + \frac{n(n-1)}{1 \times 2} x^2 + \ldots + \frac{n(n-1)\ldots(n-r+1)}{1 \times 2 \times \ldots \times r} x^r + \ldots \quad (|x| < 1, n \in \mathbb{R})$$

Logarithms and exponentials

$$\log_a x = \frac{\log_b x}{\log_b a}$$

Geometric series

$$u_n = ar^{n-1}$$

$$S_n = \frac{a(1-r^n)}{1-r}$$

$$S_\infty = \frac{a}{1-r} \quad \text{for } |r| < 1$$

Numerical integration

The trapezium rule: $\int_a^b y \ \mathrm{d}x \approx \frac{1}{2} h\{(y_0 + y_n) + 2(y_1 + y_2 + \ldots + y_{n-1})\}$, where $h = \dfrac{b-a}{n}$

Core Mathematics C1

Mensuration

Surface area of sphere $= 4\pi r^2$

Area of curved surface of cone $= \pi r \times$ slant height

Arithmetic series

$u_n = a + (n-1)d$

$S_n = \dfrac{1}{2}n(a+l) = \dfrac{1}{2}n[2a+(n-1)d]$