Questions

Q1.

(i) Find the value of $\sqrt[5]{3.2 \times 10^{11}}$

.....

(ii) Find the value of $10^{\frac{3}{4}}$
Give your answer correct to 1 decimal place.

.....

(Total for question = 2 marks)

(**Q16 1MA1/2H/S2, Specimen papers**)

Q2.

(a) Find the value of $\sqrt[3]{8 \times 10^6}$

.....

(1)

(b) Find the value of $144^{\frac{1}{2}} \times 64^{-\frac{1}{3}}$

.....

(2)

(c) Solve $3^{2x} = \frac{1}{81}$

x = ...

(2)

(Total for question = 5 marks)

(**Q15 1MA1/1H/S2, Specimen papers**)

Q3.

(a) Write down the value of $64^{\frac{1}{2}}$

.....

(1)

(b) Find the value of $\left(\frac{8}{125}\right)^{-\frac{2}{3}}$

.....

(2)

(Total for question = 3 marks)

(**Q10 1MA1/1H/N, Specimen papers**)

Q4.

(a) Simplify fully $(3x^5y^6)^4$

.....

(2)

(b) Expand and simplify $(x + 2)(x - 3)(x + 4)$

.....

(3)

(Total for question = 5 marks)

(**Q14 1MA1/3H, Nov 2022**)

Q5.

(a) Expand and simplify $(x - 2)(2x + 3)(x + 1)$

.....

(3)

$$\frac{y^4 \times y^n}{y^2} = y^{-3}$$

(b) Find the value of n.

.....

(2)

(c) Solve $5x^2 - 4x - 3 = 0$

Give your solutions correct to 3 significant figures.

.....

(3)

(Total for question = 8 marks)

(**Q09 1MA1/3H, Nov 2018**)

Q6.

(a) Expand $y(y + 5)$

.....

(1)

(b) Factorise $4a - 6$

.....

(1)

(c) Solve $2(5x - 4) = 21$

$x =$ .....

(3)

(d) Simplify $4e^2f \times 5ef^3$

.....

(2)

(Total for question = 7 marks)

(**Q17 1MA1/3F, Nov 2021**)

Q7.

(a) Find the value of $\sqrt[4]{27 \times 3 \times 10^8}$

.....

(2)

(b) Find the value of $\left(\frac{216}{1000}\right)^{-\frac{2}{3}}$

.....

(2)

(Total for question = 4 marks)

(**Q15 1MA1/1H/M2, Specimen papers**)

Q8.

(a) Find the reciprocal of 2.5

.....

(1)

(b) Work out $\sqrt[3]{\dfrac{4.3 \times \tan 39^\circ}{23.4 - 6.06}}$

Give your answer correct to 3 significant figures.

.....

(2)

(Total for question is 3 marks)

(**Q12 1MA1/2H/S1, Specimen papers**)

Q9.

Write down the value of $125^{\frac{2}{3}}$

.....

(Total for question is 1 mark)

(**Q11 1MA1/1H/S1, Specimen papers**)

Q10.

(a) Work out 3 × 5 + 7

.....

(1)

(b) Work out 2^3

.....

(1)

(c) Write brackets ( ) in this statement to make it correct.

7 × 2 + 3 = 35

(1)

(Total for question = 3 marks)

(**Q05 1MA1/1F, Nov 2018**)

Q11.

(a) Write $\frac{3^5 \times 3^4}{3^2}$ as a power of 3

.....

(2)

(b) Write down the value of 12^0

.....

(1)

(c) Write down the value of 3^{-2}

.....

(1)

(Total for question = 4 marks)

(**Q20 1MA1/1F/M3, Specimen papers**)

Q12.

(a) Write $\frac{3^5 \times 3^4}{3^2}$ as a power of 3

.....

(2)

(b) Write down the value of 12^0

.....

(1)

(c) Write down the value of 3^{-2}

.....

(1)

(Total for question = 4 marks)

(**Q01 1MA1/1H/M3, Specimen papers**)

Q13.

Work out the value of $\dfrac{3^7 \times 3^{-2}}{3^3}$

.....

(Total for question = 2 marks)

(**Q20 1MA1/1F, Nov 2018**)

Q14.

Work out the value of $\dfrac{\left(5\frac{4}{9}\right)^{-\frac{1}{2}} \times \left(4\frac{2}{3}\right)}{2^{-3}}$

You must show all your working.

.....

(Total for question = 4 marks)

(**Q18 1MA1/1H, June 2022**)

Q15.

Simplify $(2^{-5} \times 2^{8})^{2}$

Give your answer as a power of 2

.....

(Total for question = 2 marks)

(**Q03 1MA1/1H, Nov 2022**)

Q16.

Work out the value of $\left(\frac{8}{27}\right)^{\frac{4}{3}}$

.....

(Total for question = 2 marks)

(**Q17 1MA1/1H, Nov 2022**)

Q17.

(a) Write $\frac{1}{16}$ in the form 4^n where n is an integer.

.....

(1)

(b) Work out the value of $8^{\frac{5}{3}} - 9^{\frac{3}{2}}$

.....

(3)

(Total for question = 4 marks)

(Q14 1MA1/1H, June 2023)

Q18.

(a) (i) Write down the value of 5^0

.....

(1)

(ii) Write down the value of 5^{-2}

.....

(1)

(b) Write $\frac{2^5 \times 2^4}{2^3}$ in the form 2^n where n is an integer.

.....

(2)

(Total for question = 4 marks)

(**Q19 1MA1/1F, Nov 2023**)

Q19.

Work out the value of $27^{\frac{2}{3}} + \left(\frac{1}{2}\right)^{-3}$

.....

(Total for question = 3 marks)

(**Q14 1MA1/1H, Nov 2023**)

Q20.

Write down the value of 10^0

.....

(Total for question = 1 mark)

(**Q18 1MA1/1F, June 2024**)

Q21.

$$2^x = \frac{2^n}{\sqrt[3]{2}} \qquad 2^y = \left(\sqrt{2}\right)^5$$

Given that $x + y = 8$

work out the value of n.

n = ...

(Total for question = 3 marks)

(**Q20 1MA1/1H, June 2024**)

Q22.

(a) Work out $25^{\frac{1}{2}} \times 8^{\frac{1}{3}}$

.....

(2)

(b) Find the value of $\left(\frac{1}{32}\right)^{\frac{3}{5}}$

.....

(2)

(Total for question = 4 marks)

(**Q10 1MA1/1H, Nov 2024**)

Q23.

(a) Simplify fully $2x^3y^5 \times 7x^2y$

.....

(2)

(b) Simplify $(m^2)^{-3}$

.....

(1)

(Total for question = 3 marks)

(**Q25 1MA1/3F, Nov 2024**)

Q24.

Given that $9^{-\frac{1}{2}} = 27^{\frac{1}{4}} \div 3^{x+1}$
find the exact value of x.

x = ...

(Total for question = 3 marks)

(**Q19 1MA1/1H, Nov 2019**)

Q25.

(a) Work out the value of $\left(\frac{16}{81}\right)^{\frac{3}{4}}$

.....

(2)

$3^a = \frac{1}{9}$ $3^b = 9\sqrt{3}$ $3^c = \frac{1}{\sqrt{3}}$

(b) Work out the value of $a + b + c$

.....

(2)

(Total for question = 4 marks)

(**Q14 1MA1/1H, Nov 2018**)

Q26.

(a) Simplify $(x^3)^5$

.....

(1)

(b) Expand and simplify $4(x + 3) + 7(4 - 2x)$

.....

(2)

(c) Factorise fully $15x^3 + 3x^2y$

.....

(2)

(Total for question = 5 marks)

(**Q21 1MA1/2F, June 2022**)

Q27.

(a) Simplify $(m^2)^3$

.....

(1)

(b) Simplify $x^5 \times x^8$

.....

(1)

(c) Expand $4p\ (p^2 + 3p)$

.....

(2)

(Total for question = 4 marks)

(**Q01 1MA1/3H, June 2023**)

Q28.

Work out the value of $\dfrac{4^{-6} \times 4^9}{4}$

.....

(Total for question = 2 marks)

(**Q29 1MA1/1F, June 2023**)

Q29.

Write $\dfrac{(6x^5y^3)^2}{3x^2y^7 \times 4xy^{-3}}$ in the form ax^by^c where a, b and c are integers.

.....

(Total for question = 3 marks)

(**Q11 1MA1/1H, June 2023**)

Q30.

(a) Simplify $n^3 \times n^5$

.....

(1)

(b) Simplify $\dfrac{c^3d^4}{c^2d}$

.....

(2)

(c) Solve $\dfrac{5x}{2} > 7$

.....

(2)

(Total for question = 5 marks)

(**Q01 1MA1/3H, Nov 2020**)

Q31.

(a) Express $\sqrt{\frac{10^{360}}{10^{150} \times 10^{90}}}$ as a power of 10

.....

(3)

Liam was asked to express $(12^{50})^2$ as a power of 12

Liam wrote $(12^{50})^2 = 12^{502} = 12^{2500}$

Liam's method is wrong.

(b) Explain why.

.....

.....

.....

(1)

(Total for question = 4 marks)

(**Q09 1MA1/3H, June 2022**)

Q32.

Simplify $(2^{-5} \times 2^{8})^{2}$

Give your answer as a power of 2

.....

(Total for question = 2 marks)

(**Q21 1MA1/1F, Nov 2022**)

Q33.

(a) Simplify $(m^{2})^{3}$

.....

(1)

(b) Simplify $x^{5} \times x^{8}$

.....

(1)

(c) Expand $4p\ (p^{2} + 3p)$

.....

(2)

(Total for question = 4 marks)

(**Q20 1MA1/3F, June 2023**)

Q34.

$$(ax^6)^{\frac{1}{n}} = 7x^3$$

Work out the value of *a* and the value of *n*.

a = ...

n = ...

(Total for question = 2 marks)

(**Q12 1MA1/3H, Nov 2021**)

Q35.

$16^{1/5} \times 2^x = 8^{3/4}$

Work out the exact value of *x*.

.....

(Total for question = 3 marks)

(**Q18 1MA1/2H, June 2017**)

Q36.

Given that $3^{-n} = 0.2$

find the value of $(3^4)^n$

.....

(Total for question = 2 marks)

(**Q14 1MA1/2H/M1, Specimen papers**)

Q37.

(a) Write down the value of 7^0

.....

(1)

(b) Find the value of $3 \times 3^6 \times 3^{-6}$

.....

(1)

(c) Find the value of 2^{-4}

.....

(1)

(d) Find the value of $27^{\frac{1}{3}}$

.....

(1)

(Total for question = 4 marks)

(**Q09 1MA1/1H, Nov 2021**)

Q38.

(a) Simplify $c^5 \div c^2$

.....

(1)

(b) Simplify $(d^4)^3$

.....

(1)

(Total for question = 2 marks)

(**Q20 1MA1/2F, Nov 2021**)

Q39.

(a) Write down the value of $100^{\frac{1}{2}}$

.....

(1)

(b) Find the value of $125^{\frac{2}{3}}$

.....

(2)

(Total for question = 3 marks)

(**Q10 1MA1/1H, Nov 2017**)

Q40.

$p^3 \times p^x = p^9$

(a) Find the value of x.

$x =$ .....

(1)

$(7^2)^y = 7^{10}$

(b) Find the value of y.

$y =$ .....

(1)

$100^a \times 1000^b$ can be written in the form 10^w

(c) Show that $w = 2a + 3b$

(2)

(Total for question = 4 marks)

(**Q21 1MA1/2F, Nov 2017**)

Q41.

Find the value of $64^{-\frac{2}{3}}$

.....

(Total for question = 1 mark)

(**Q10 1MA1/1H/M1, Specimen papers**)

Q42.

(a) Find the value of $81^{-\frac{1}{2}}$

.....

(2)

(b) Find the value of $\left(\frac{64}{125}\right)^{\frac{2}{3}}$

.....

(2)

(Total for question = 4 marks)

(**Q12 1MA1/1H, June 2017**)

Q43.

Work out the value of 3^5

.....

(Total for question = 1 mark)

(**Q03 1MA1/2F, June 2018**)

Q44.

(a) Write down the value of $36^{\frac{1}{2}}$

.....

(1)

(b) Write down the value of 23^0

.....

(1)

(c) Work out the value of $27^{-\frac{2}{3}}$

.....

(2)

(Total for question = 4 marks)

(**Q09 1MA1/1H, June 2018**)