

Number

ANSWERS

No calculator | 30 minutes | Total marks: 30

Name Class

1 Write 360 as a product of its prime factors.

Give your answer in index form.

$$360 = 2 \times 180 = 2 \times 2 \times 90 = 2 \times 2 \times 2 \times 45 \text{ (1)}$$
$$= 2 \times 2 \times 2 \times 3 \times 3 \times 5 \text{ (1)}$$

Answer $2^3 \times 3^2 \times 5$ (1) [3 marks]

2 $84 = 2^2 \times 3 \times 7$ $120 = 2^3 \times 3 \times 5$

(a) Work out the highest common factor of 84 and 120

$$2^2 \times 3 \text{ (1)}$$

Answer 12 (1) [2 marks]

(b) Work out the lowest common multiple of 84 and 120

$$2^3 \times 3 \times 5 \times 7 \text{ (1)}$$

Answer 840 (1) [2 marks]

3 Three buses leave a bus station at 8:00 am.

Bus A leaves every 12 minutes.

Bus B leaves every 18 minutes.

Bus C leaves every 30 minutes.

Work out the next time that all three buses leave together.

$$12 = 2^2 \times 3 \quad 18 = 2 \times 3^2 \quad 30 = 2 \times 3 \times 5 \text{ (1)}$$
$$\text{LCM} = 2^2 \times 3^2 \times 5 = 180 \text{ minutes (1)}$$

Answer $11:00 \text{ am}$ (1) [3 marks]

4

Work out

(a) 13^2

Answer 169 (1)

[1 mark]

(b) the cube root of 125

Answer 5 (1)

[1 mark]

(c) $\sqrt{(10^2 - 6^2)}$

Answer 8 (1)

[1 mark]

5

Work out $\frac{4 + 3^2 \times 2}{(7 - 5)^2 + 7}$

$$\frac{4 + 18}{4 + 7} = \frac{22}{11} \quad (1)$$

Answer 2 (1)

[2 marks]

6

Simplify

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

Answer a^8 (1)

[1 mark]

(b) $\frac{12x^7}{4x^2}$

Answer $3x^5$ (1)(1)

[2 marks]

(c) $(2y^3)^4$

Answer $16y^{12}$ (1)(1)

[2 marks]

(d) m^0

Answer 1 (1)

[1 mark]

7

Work out the value of

(a) 5^{-2}

Answer $\frac{1}{25}$ (1)

[1 mark]

(b) $49^{\frac{1}{2}}$

Answer 7 (1)

[1 mark]

(c) $8^{\frac{2}{3}}$

cube root of 8 is 2 (1)

Answer 4 (1)

[2 marks]

(d) $(\frac{4}{9})^{-\frac{1}{2}}$

$(\frac{9}{4})^{\frac{1}{2}}$ (1)

Answer $\frac{3}{2}$ (1)

[2 marks]

8

(a) $2^x = \frac{1}{8}$

Write down the value of x.

$x = -3$ (1)

[1 mark]

(b) Write 8×4^2 as a single power of 2

$2^3 \times 2^4$ (1)

Answer 2^7 (1)

[2 marks]

Question	Topic	RAG
1	I can write a number as a product of prime factors	
2	I can use prime factors to find the HCF and LCM	
3	I can solve a problem using the LCM	
4	I know squares, cubes and their roots	
5	I can use the order of operations (BIDMAS)	
6	I can use the laws of indices	
7	I can work with negative and fractional indices	
8	I can write numbers as powers of 2	