

Indices, Standard Form and Surds

ANSWERS

No calculator | 30 minutes | Total marks: 30

Name Class

1 Work out the value of

(a) 2^6

Answer 64 (1) [1 mark]

(b) 5^{-2}

Answer $\frac{1}{25}$ (1) [1 mark]

(c) $64^{\frac{1}{3}}$

Answer 4 (1) [1 mark]

(d) $16^{\frac{3}{4}}$

fourth root of 16 is 2 (1)

Answer 8 (1) [2 marks]

(e) $(\frac{27}{8})^{-\frac{2}{3}}$

$(\frac{8}{27})^{\frac{2}{3}}$ (1)

Answer $\frac{4}{9}$ (1) [2 marks]

2 (a) Write down the two consecutive whole numbers that $\sqrt{70}$ lies between.

Answer 8 and 9 (1) [1 mark]

(b) Write $\frac{1}{8}$ as a power of 2

Answer 2^{-3} (1) [1 mark]

3

- (a) Write 0.000 052 in standard form.

Answer 5.2×10^{-5} (1) [1 mark]

- (b) Write 7.3×10^6 as an ordinary number.

Answer 7 300 000 (1) [1 mark]

- (c) Work out $(4 \times 10^5) \times (6 \times 10^{-2})$

Give your answer in standard form.

$$24 \times 10^3 \text{ (1)}$$

Answer 2.4×10^4 (1) [2 marks]

- (d) Work out $\frac{3 \times 10^7}{6 \times 10^2}$

Give your answer in standard form.

$$0.5 \times 10^5 \text{ (1)}$$

Answer 5×10^4 (1) [2 marks]

- (e) Work out $5 \times 10^4 + 7 \times 10^3$

Give your answer in standard form.

$$50\,000 + 7\,000 \text{ (1)}$$

Answer 5.7×10^4 (1) [2 marks]

4

(a) Simplify $\sqrt{48}$ Answer $4\sqrt{3}$ (1)

[1 mark]

(b) Simplify $\sqrt{12} + \sqrt{27}$

$$2\sqrt{3} + 3\sqrt{3} \text{ (1)}$$

Answer $5\sqrt{3}$ (1)

[2 marks]

(c) Work out $\sqrt{5} \times \sqrt{20}$ Answer 10 (1)

[1 mark]

(d) Expand and simplify $(3 + \sqrt{2})(3 - \sqrt{2})$

$$9 - 3\sqrt{2} + 3\sqrt{2} - 2 \text{ (1)}$$

Answer 7 (1)

[2 marks]

(e) Expand and simplify $(2 + \sqrt{3})^2$

$$4 + 2\sqrt{3} + 2\sqrt{3} + 3 \text{ (1)}$$

Answer $7 + 4\sqrt{3}$ (1)

[2 marks]

5

Rationalise the denominator and simplify.

(a) $\frac{10}{\sqrt{5}}$

$$\frac{10\sqrt{5}}{5} \quad (1)$$

Answer $2\sqrt{5} \quad (1)$ [2 marks]

(b) $\frac{2}{3+\sqrt{5}}$

$$\frac{2(3-\sqrt{5})}{(3+\sqrt{5})(3-\sqrt{5})} \quad (1)$$
$$\frac{2(3-\sqrt{5})}{4} \quad (1)$$

Answer $\frac{3-\sqrt{5}}{2} \quad (1)$ [3 marks]

Question	Topic	RAG
1	I can work with integer, negative and fractional indices	
2	I can estimate roots and write numbers as powers	
3	I can calculate in standard form	
4	I can simplify and expand surds	
5	I can rationalise a denominator	