

## Non-Calculator

### Q1.

Find **two** sets of values for  $c$  and  $d$  such that

$$16^c = 2^d$$

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$$c = \underline{\quad\quad\quad} \text{ and } d = \underline{\quad\quad\quad}$$

$$\text{or } c = \underline{\quad\quad\quad} \text{ and } d = \underline{\quad\quad\quad}$$

(Total 3 marks)

### Q2.

(a) Work out the value of  $81^{\frac{-1}{4}}$

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Answer \_\_\_\_\_

(2)

(b) Write  $16 \times 8^{2x}$  as a power of 2 in terms of  $x$ .

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Answer \_\_\_\_\_

(3)

(Total 5 marks)

**Q3.**

Work out  $64^{\frac{2}{3}}$

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Answer \_\_\_\_\_

**(Total 2 marks)**

**Q4.**

(a) Work out the value of  $9^{\frac{3}{2}}$

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Answer \_\_\_\_\_

**(3)**

(b) Work out **all** solutions of the equation

$$8^m = 2^{m^2}$$

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Answer \_\_\_\_\_

**(3)**

**(Total 6 marks)**

**Q5.**

Work out the value of  $9^{-\frac{1}{2}}$

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Answer \_\_\_\_\_

**(Total 2 marks)**

**Q6.**

(a) Simplify fully  $\frac{m^3 \times m^5 \times m}{m^2 \times m^4}$

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Answer \_\_\_\_\_

**(1)**

(b) Expand and simplify  $(3 + \sqrt{2})(5 - \sqrt{2})$

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Answer \_\_\_\_\_

**(2)**

(c) Work out the value of  $25^{-\frac{1}{2}} \times 81^{\frac{3}{4}}$

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Answer \_\_\_\_\_

**(3)**

**(Total 6 marks)**

**Q7.**

Estimate the value of  $101.4^{\frac{1}{2}} + 6.43^0 \times 7.99^{\frac{2}{3}}$

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Answer \_\_\_\_\_

(Total 4 marks)

**Q8.**

(a) Circle the value of the reciprocal of 0.2

$\frac{2}{10}$

$\frac{1}{2}$

$\frac{1}{20}$

0.8

5

(1)

(b) Circle the value of  $8.5^0$

0

1

8.1

8.5

(1)

(c) Work out  $27^{\frac{1}{3}} \times 7^{-2}$

Give your answer as a fraction.

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Answer \_\_\_\_\_

(3)

(Total 5 marks)

**Q9.**

Work out  $\sqrt[3]{8} \times 5^{-2}$

Give your answer as a decimal.

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Answer \_\_\_\_\_

(Total 3 mark)

**Q10.**

Circle the value of  $9^{-\frac{1}{2}}$

$$\frac{1}{81}$$

$$\frac{1}{3}$$

$$-3$$

$$-4\frac{1}{2}$$

(Total 1 mark)

## Calculator

**Q11.**

Given that  $\frac{2^{3x}}{2^{(x-5)}} = 2^{17}$

Work out the value of  $x$ .

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$x =$  \_\_\_\_\_

**(Total 3 marks)**

**Q12.**

Express  $\frac{1}{\sqrt[3]{x^2}}$  in the form  $x^a$

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Answer \_\_\_\_\_

**(Total 3 marks)**