1.9 Powers and Roots: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Work out the value of each cube.

(a) 2^3 **(1)**

.....

(b) 3^3 **(1)**

.....

(c) 10^3 **(1)**

.....

(Total for Question 1 is 3 marks)

2 Write down the value of each power of 10.

(a) 10^1 **(1)**

.....

(b) 10^3 **(1)**

.....

(c) 10^0 **(1)**

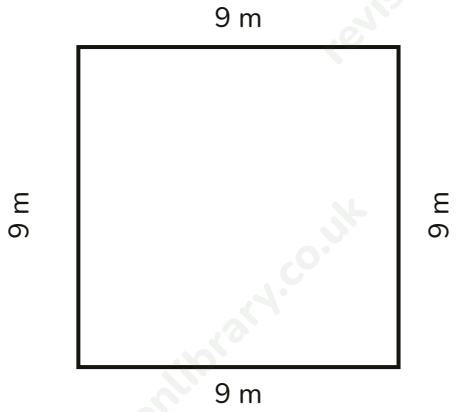
.....

(Total for Question 2 is 3 marks)

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3 Priya has a square vegetable patch. Each side of the patch has length 9 m. Work out the area of the vegetable patch.

Diagram NOT accurately drawn



(Total for Question 3 is 2 marks)

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4 Work out 9^2.

(Total for Question 4 is 1 mark)

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5 Write 5 x 5 x 5 in index form.

(Total for Question 5 is 1 mark)

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6 Show that $4^2 + 3^2 = 5^2$

(Total for Question 6 is 2 marks)

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7 The value of $\sqrt{163}$ lies between two consecutive whole numbers. Write down the two whole numbers.

(Total for Question 7 is 2 marks)

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8 Which two consecutive integers does the cube root of 50 lie between?

(Total for Question 8 is 1 mark)

---

9 Simplify each expression, leaving your answer as a single power.

(a) b^7 / b^2 **(1)**

(b) c^6 / c^6 **(1)**

(Total for Question 9 is 2 marks)

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10 Simplify $(4^2)^3$ and give your answer as an ordinary number.

(Total for Question 10 is 2 marks)

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11 Write 0.0004 in index form (standard form with a power of 10).

(Total for Question 11 is 2 marks)

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12 Solve $3^{2x} = 81$. Give the value of x.

(Total for Question 12 is 2 marks)

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Mark scheme · 1.9 Powers and Roots: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) 8 cao **B1**

(a) Answer: 8

(b) 27 cao **B1**

(b) Answer: 27

(c) 1000 cao **B1**

(c) Answer: 1000

Question 2

(a) 10 cao **B1**

(a) Answer: 10

(b) 1000 cao **B1**

(b) Answer: 1000

(c) 1 cao **B1**

(c) Answer: 1

Question 3

9 x 9 (or 9^2) seen **M1**

81 m² cao (units required) **A1**

Answer: 81 m^2

Question 4

81 cao **B1**

Answer:81
(9 times 9 = 81).

Question 5

5^3 cao **B1**

Answer: 5^3

Question 6

$4^2 + 3^2 = 16 + 9 = 25$ shown **B1**

$5^2 = 25$ stated, so both sides are equal, cso **B1**

Answer: 25 = 25, so the statement is true

Question 7

$12^2 = 144$ or $13^2 = 169$ seen **M1**

12 and 13 **A1**

Answer: 12 and 13

Question 8

3 and 4 cao **B1**

Answer:Between 3 and 4
(since $3^3 = 27$ and $4^3 = 64$, and $27 < 50 < 64$).

Question 9

(a) b^5 oe **B1**

(a) Answer: b^5

(b) 1 cao (accept c^0) **B1**

(b) Answer: 1

Question 10

use index law $(a^m)^n = a^{mn}$ to get $4^{2x3} = 4^6$ **M1**

4096 cao **A1**

Answer:4096
($(4^2)^3 = 4^6 = 4096$).

Question 11

move decimal point 4 places to write as 4×10^n **M1**

4×10^{-4} cao **A1**

Answer:4×10^{-4}
($0.0004 = 4 \times 10^{-4}$).

Question 12

recognise $81 = 3^4$ (or use logs) so $2x = 4$ **M1**

$x = 2$ cao **A1**

Answer: $x = 2$

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