1.9 Powers and Roots: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Work out $\sqrt{121}$.

(Total for Question 1 is 1 mark)

2 Work out the cube root of 27.

(Total for Question 2 is 1 mark)

3 Work out $(-6)^2$.

(Total for Question 3 is 1 mark)

4 Work out $(-3)^3$.

(Total for Question 4 is 1 mark)

5 Work out $\sqrt{0.16}$.

(Total for Question 5 is 1 mark)

6 Work out the cube root of -8.

(Total for Question 6 is 1 mark)

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7 Remember to use the correct order of operations.

(a) Work out $4 + 3^2$ **(2)**

.....

(b) Work out $(4 + 3)^2$ **(2)**

.....

(Total for Question 7 is 4 marks)

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8 Work out the value of each expression, using the correct order of operations.

(a) $2 \times 5^2 - 3^2$ **(2)**

.....

(b) $20 - 2 \times 3^2$ **(2)**

.....

(Total for Question 8 is 4 marks)

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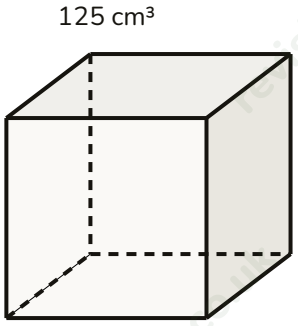
9 Write down the value of the cube root of 729.

(Total for Question 9 is 1 mark)

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10 A cube has a volume of 125 cm³. Work out the total surface area of the cube.

Diagram NOT accurately drawn



(Total for Question 10 is 3 marks)

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11 A square has a perimeter of 60 cm. Work out the area of the square.

(Total for Question 11 is 3 marks)

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12 Write down the value of $\sqrt{81}$.

(Total for Question 12 is 1 mark)

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13 Work out $5^2 \times 2^2$

(Total for Question 13 is 2 marks)

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14 Work out the value of $4^2 + 2^3$

(Total for Question 14 is 2 marks)

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15 The value of $\sqrt{170}$ lies between two consecutive whole numbers. Write down the two whole numbers.

(Total for Question 15 is 2 marks)

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16 Work out 8^3

(Total for Question 16 is 1 mark)

---

17 Work out the value of $9^2 + 2^3$

(Total for Question 17 is 2 marks)

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18 Work out 9^3

(Total for Question 18 is 1 mark)

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19 Work out $3^4 \times 4^3$

(Total for Question 19 is 2 marks)

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20 Work out the value of $4^2 + 6^3$

(Total for Question 20 is 2 marks)

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21 The value of $\sqrt{31}$ lies between two consecutive whole numbers. Write down the two whole numbers.

(Total for Question 21 is 2 marks)

---

22 Write down the value of the cube root of 343.

(Total for Question 22 is 1 mark)

---

23 A square has an area of 144 cm². Work out the perimeter of the square.

(Total for Question 23 is 3 marks)

---

24 Simplify $d^3 \times d^4 / d^2$, leaving your answer as a single power.

(Total for Question 24 is 2 marks)

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25 Simplify $(10^2) / (10^4)$. Give your answer in ordinary number form.

(Total for Question 25 is 2 marks)

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Mark scheme · 1.9 Powers and Roots: 1-hour Pack

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

Question 1

11 cao **B1**

Answer:11
($\sqrt{121}$ = 11).

Question 2

3 cao **B1**

Answer:3
(3^3 = 27).

Question 3

36 cao **B1**

Answer: 36

Question 4

-27 cao **B1**

Answer: -27

Question 5

0.4 cao **B1**

Answer: 0.4

Question 6

-2 cao **B1**

Answer: -2

Question 7

(a) 3^2 = 9 evaluated before the addition **M1**

(a) 13 cao **A1**

(a) Answer: 13

(b) 4 + 3 = 7 evaluated before the squaring **M1**

(b) 49 cao **A1**

(b) Answer: 49

Question 8

(a) 5^2 = 25 and 3^2 = 9 both evaluated (or 2 x 25 = 50 seen) **M1**

(a) 41 cao **A1**

(a) Answer: 41

(b) 3^2 = 9 and 2 x 9 = 18 seen **M1**

(b) 2 cao **A1**

(b) Answer: 2

Question 9

9 cao **B1**

Answer: 9

Question 10

cube root of 125 or 5 seen **M1**

6 x 5^2 **M1**

150 cm² cao **A1**

Answer: 150 cm^2

Question 11

60 / 4 or 15 seen **M1**

15 x 15 **M1**

225 cm² cao **A1**

Answer: 225 cm^2

Question 12

9 cao **B1**

Answer: 9

Question 13

25 or 4 seen **M1**

100 cao **A1**

Answer: 100

Question 14

16 or 8 seen **M1**

24 cao **A1**

Answer: 24

Question 15

13^2 = 169 or 14^2 = 196 seen **M1**

13 and 14 **A1**

Answer: 13 and 14

Question 16

512 cao **B1**

Answer: 512

Question 17

81 or 8 seen **M1**

89 cao **A1**

Answer: 89

Question 18

729 cao **B1**

Answer: 729

Question 19

81 or 64 seen **M1**

5184 cao **A1**

Answer: 5184

Question 20

16 or 216 seen **M1**

232 cao **A1**

Answer: 232

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Question 21

$5^2 = 25$ or $6^2 = 36$ seen **M1**

5 and 6 **A1**

Answer: 5 and 6

Question 22

7 cao **B1**

Answer: 7

Question 23

$\sqrt{144}$ or 12 seen **M1**

4 x 12 **M1**

48 cm cao **A1**

Answer: 48 cm

Question 24

correct combination of the powers, e.g. d^{3+4-2} or d^7 / d^2 seen **M1**

d^5 oe cao **A1**

Answer: d^5

Question 25

use index law: subtract powers to get $10^{2-4} = 10^{-2}$ **M1**

0.01 cao **A1**

Answer:0.01
($10^{-2} = 0.01$).

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