1.15 Roots, Powers and Exact Values: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Simplify $(\sqrt{5})^3$ and give the exact form.

(2)

2 Find each exact power.

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

(b) 4^3 **(1)**

3 Write $\sqrt{245}$ in the form $a\sqrt{5}$, where a is a whole number.

(2)

4 $\sqrt{71}$ lies between two consecutive whole numbers. Write down the two numbers.

(2)

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5 Write down the value of the cube root of 27.

(1)

6 Work out $9^3 - 4^3$.

(2)

7 Work out $\sqrt{7} \times \sqrt{112}$. Give your answer as a whole number.

(2)

8 Solve $x^2 - 19 = 45$.

(3)

9 Write $\sqrt{45}$ in the form $a\sqrt{b}$ with b simplified.

(2)

10 Solve $x^2 = 81$.

(2)

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11 Give the exact values.

(a) $(\sqrt{3})^2$ **(1)**

(b) $\sqrt{5} \times \sqrt{5}$ **(1)**

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12 Evaluate $\sqrt{121}$.

(1)

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Mark scheme · 1.15 Roots, Powers and Exact Values: 30-minute Pack

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

Question 1

recognise $(\sqrt{5})^3 = (\sqrt{5})^2 \times \sqrt{5}$ or $5 \times \sqrt{5}$ — **M1**

$5\sqrt{5}$ cao — **A1**

Answer: **$5\sqrt{5}$**

Question 2

(a) 49 cao — **B1**

(a) Answer: **49**

(b) 64 cao — **B1**

(b) Answer: **64**

Question 3

$245 = 49 \times 5$ or $\sqrt{49} = 7$ seen — **M1**

$7\sqrt{5}$ cao — **A1**

Answer: **$7\sqrt{5}$**

Question 4

$8^2 = 64$ or $9^2 = 81$ seen — **M1**

8 and 9 cao — **A1**

Answer: **8 and 9**

Question 5

3 cao — **B1**

Answer: **3**

Question 6

$9^3 = 729$ or $4^3 = 64$ found — **M1**

665 cao — **A1**

Answer: **665**

Question 7

$\sqrt{784}$ or 7×4 seen — **M1**

28 cao — **A1**

Answer: **28**

Question 8

$x^2 = 64$ (adds 19 to both sides) — **M1**

$\sqrt{64} = 8$ — **M1**

$x = 8$ or $x = -8$ cao — **A1**

Answer: **$x = 8$ or $x = -8$**

Question 9

factor 45 as 9×5 or identify 9 as largest square factor — **M1**

$3\sqrt{5}$ cao — **A1**

Answer: **$3\sqrt{5}$**

Question 10

$\sqrt{81} = 9$ or one correct solution — **M1**

$x = 9$ or $x = -9$ cao — **A1**

Answer: **$x = 9$ or $x = -9$**

Question 11

(a) 3 cao — **B1**

(a) Answer: **3**

(b) 5 cao — **B1**

(b) Answer: **5**

Question 12

11 cao — **B1**

Answer: **11**

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