HIGHER

# 6.2 Fractional and Negative Indices: 30-minute Pack

Total Marks

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** Work out the value of:

**(a)** $64^{1/2}$ **(1)**

**(b)** $8^{1/3}$ **(1)**

**(c)** $81^{1/4}$ **(1)**

**(Total for Question 1 is 3 marks)**

**2** Solve the equations:

**(a)** $x^{1/2} = 7$ **(1)**

**(b)** $x^{2/3} = 25$ **(2)**

**(Total for Question 2 is 3 marks)**

**3** Show that $9^{-1/2} \times 3^4 = 27$

**(Total for Question 3 is 3 marks)**


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**4** Work out the value of $27^{-2/3}$. Give your answer as a fraction.

**(Total for Question 4 is 3 marks)**

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**5** Write cube root of $x^2$ in the form $x^n$, where n is a fraction or integer.

**(Total for Question 5 is 2 marks)**

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**6** Simplify $(9x^4)^{-1/2}$.

**(Total for Question 6 is 2 marks)**

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**7** Simplify, leaving your answer in index form:

**(a)** $x^5 \times x^{-2}$ **(1)**

**(b)** $y^3 / y^{-4}$ **(1)**

**(c)** $(m^{-2})^3$ **(1)**

**(Total for Question 7 is 3 marks)**


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**8** Which of the following is equal to $1/(x^3)$?

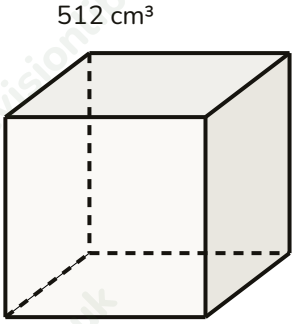
- ☐ A) $x^{-3}$
- ☐ B) $x^3$
- ☐ C) $-x^3$
- ☐ D) $x^{1/3}$

**(Total for Question 8 is 1 mark)**

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**9** A cube-shaped storage box has volume V = 512 cm³. The side length of the cube is given by $l = V^{1/3}$.

Diagram NOT accurately drawn




**(a)** Work out the side length, l, of the cube. **(1)**

.....

**(b)** The total surface area of a cube is given by $A = 6l^2$. Work out the total surface area of the box, stating the correct units. **(2)**

.....

**(Total for Question 9 is 3 marks)**


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# Mark scheme · 6.2 Fractional and Negative Indices: 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) 2 cao **B1**

**(b) Answer: 2**

(c) 3 cao **B1**

**(c) Answer: 3**

## Question 2

(a) x = 49 cao **B1**

**(a) Answer: x = 49**

(b) $x^{1/3} = 5$ (from $\sqrt{25} = 5$), or $x = 25^{3/2}$ seen **M1**

(b) x = 125 cao **A1**

**(b) Answer: x = 125**

## Question 3

$9^{-1/2} = 1/3$ oe **M1**

$3^4 = 81$ seen **M1**

cso: (1/3) x 81 = 27 shown, dependent on both method marks **A1**

**Answer: 27 (shown)**

## Question 4

$27^{1/3} = 3$ seen **M1**

$3^2 = 9$, i.e. $27^{2/3} = 9$ seen **M1**

1/9 oe cao **A1**

**Answer: 1/9**

## Question 5

correct use of a fractional or negative index **M1**

$x^{2/3}$ oe **A1**

**Answer: $x^{2/3}$**

## Question 6

$(9)^{1/2} = 3$ or $(x^4)^{1/2} = x^2$ **M1**

$1/(3x^2)$ oe **A1**

**Answer: $1/(3x^2)$**

## Question 7

(a) $x^3$ cao **B1**

**(a) Answer: $x^3$**

(b) $y^7$ cao **B1**

**(b) Answer: $y^7$**

(c) $m^{-6}$ cao **B1**

**(c) Answer: $m^{-6}$**

## Question 8

A $(x^{-3})$ cao **B1**

**Answer: A) $x^{-3}$**

## Question 9

(a) 8 (cm) cao **B1**

**(a) Answer: 8 cm**

(b) 6 x $8^2$ (= 384) seen, ft from (a) **M1**

(b) 384 $cm^2$, correct units required **A1**

**(b) Answer: 384 $cm^2$**


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