

N60 Surds Adding and Subtracting

OCR

15 (a) Simplify fully.

(i) $\sqrt{50} + \sqrt{2}$

(a)(i) [2]

(ii) $\frac{10}{\sqrt{6}}$

(ii) [2]

15 (a) Simplify fully.

N59/60 (i) $\sqrt{50} + \sqrt{2}$

$$\begin{array}{c} \sqrt{50} \\ \sqrt{25} \sqrt{2} \\ 5\sqrt{2} \end{array}$$

$$5\sqrt{2} + \sqrt{2}$$

(a)(i) [2]

$$6\sqrt{2}$$

(ii) $\frac{10}{\sqrt{6}}$
Nb2

$$\frac{10}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} = \frac{10\sqrt{6}}{\cancel{6}_3} =$$

$$\frac{5\sqrt{6}}{3} \checkmark$$

(ii) [2]

(b) There are two errors in Sam's method for finding the value of $64^{-\frac{2}{3}}$ shown below.

Find the cube root of 64 and then multiply by 2.

The cube root of 64 is 4 and then $4 \times 2 = 8$.

The negative power makes the answer negative so answer equals -8.

Describe these errors and then give the correct value of $64^{-\frac{2}{3}}$.

.....

.....

Correct value [3]

(b) There are two errors in Sam's method for finding the value of $64^{-\frac{2}{3}}$ shown below.

NS4

Find the cube root of 64 and then multiply by 2.

The cube root of 64 is 4 and then $4 \times 2 = 8$.

The negative power makes the answer negative so answer equals -8.

Describe these errors and then give the correct value of $64^{-\frac{2}{3}}$.

$$64^{-\frac{2}{3}} \Rightarrow \left(\frac{1}{64}\right)^{\frac{2}{3}} \Rightarrow \left(\sqrt[3]{\frac{1}{64}}\right)^2 = \left(\frac{1}{4}\right)^2 = \frac{1}{16}$$

She needed to get the reciprocal of 64 to deal with the negative. She $\times 2$ rather than squaring.

Correct value $\frac{1}{16}$ [3]

16 (a) Write $\sqrt{12} + \sqrt{75}$ in the form $k\sqrt{3}$.

N60

(a) **[3]**

16 (a) Write $\sqrt{12} + \sqrt{75}$ in the form $k\sqrt{3}$.

N60

$$\begin{array}{l} \sqrt{12} \\ \sqrt{4}\sqrt{3} \\ 2\sqrt{3} \end{array} + \begin{array}{l} \sqrt{75} \\ \sqrt{25}\sqrt{3} \\ 5\sqrt{3} \end{array}$$

(a) $7\sqrt{3}$ [3]

Edexcel

AQA

28 Simplify $\sqrt{80} + \sqrt{2\frac{2}{9}}$

N59 Give your answer in the form $\frac{a\sqrt{5}}{b}$ where a and b are integers.
N60

[3 marks]

Answer _____

28

Simplify $\sqrt{80} + \sqrt{2\frac{2}{9}}$

N59

Give your answer in the form $\frac{a\sqrt{5}}{b}$ where a and b are integers.

N60

[3 marks]

$$\left. \begin{array}{l} \sqrt{80} \\ \sqrt{16}\sqrt{5} \\ 4\sqrt{5} \end{array} \right\} \sqrt{\frac{20}{9}} = \frac{\sqrt{20}}{\sqrt{9}} = \frac{\sqrt{4}\sqrt{5}}{3} = \frac{2\sqrt{5}}{3}$$

$$\frac{4\sqrt{5}}{1} + \frac{2\sqrt{5}}{3}$$

$$\frac{12\sqrt{5}}{3} + \frac{2\sqrt{5}}{3} = \frac{14\sqrt{5}}{3} \checkmark$$

Answer _____

24 Show that $\frac{2\sqrt{6}}{\sqrt{5}} - \frac{\sqrt{3}}{\sqrt{10}}$ can be written in the form $\frac{c\sqrt{d}}{10}$

N59 where c and d are integers.

N60

N62

[3 marks]

24 Show that $\frac{2\sqrt{6}}{\sqrt{5}} - \frac{\sqrt{3}}{\sqrt{10}}$

can be written in the form $\frac{c\sqrt{d}}{10}$

N59

where c and d are integers.

N60

N62

$$\frac{2\sqrt{6}\sqrt{2}}{\sqrt{5}\sqrt{2}}$$

$$= \frac{2\sqrt{12}}{\sqrt{10}}$$

$$\frac{2\sqrt{4}\sqrt{3}}{\sqrt{10}}$$

$$\frac{2(2)\sqrt{3}}{\sqrt{10}} = \frac{4\sqrt{3}}{\sqrt{10}}$$

$$\frac{2\sqrt{12}}{\sqrt{10}} - \frac{\sqrt{3}}{\sqrt{10}}$$

[3 marks]

$$= \frac{4\sqrt{3}}{\sqrt{10}} - \frac{\sqrt{3}}{\sqrt{10}}$$

$$= \frac{3\sqrt{3}}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{3\sqrt{30}}{10}$$

$$= \frac{3\sqrt{30}}{10}$$