2.3 Answers

A-Level Pure Mathematics : Year 1
GCSE (Grades 8 and 9)
Algebra of Surds and Indices I

2.3.1 Solutions (2.1 Example)

Method 1 : Less Mathematical

$$\begin{aligned} & 2\sqrt{15} \times 4\sqrt{10} \\ &= 2 \times \sqrt{3} \times \sqrt{5} \times 4 \times \sqrt{2} \times \sqrt{5} \\ &= 2 \times 4 \times (\sqrt{5} \times \sqrt{5}) \times \sqrt{3} \times \sqrt{2} \\ &= 8 \times 5 \times \sqrt{3} \times \sqrt{2} \\ &= 40\sqrt{6} \end{aligned}$$

Method 2 : More Mathematical

$$\begin{aligned} & 2\sqrt{15} \times 4\sqrt{10} \\ &= 8 \times \sqrt{150} \\ &= 8 \times \sqrt{25 \times 6} \\ &= 8 \times 5 \times \sqrt{6} \\ &= 40\sqrt{6} \end{aligned}$$

[2 marks]

2.3.2 Solutions to 2.2 Exercise

Answer 1

(i) $63\sqrt{14}$ **(ii)** $20\sqrt{35}$
(iii) $80\sqrt{33}$ **(iv)** $60\sqrt{22}$

[8 marks]

Answer 2

(i)	$2\sqrt{3}$	**(ii)**	$2\sqrt{5}$	**(iii)**	$2\sqrt{2}$
(iv)	$3\sqrt{5}$	**(v)**	$4\sqrt{3}$	**(vi)**	$11\sqrt{2}$
(vii)	$5\sqrt{3}$	**(viii)**	$9\sqrt{2}$	**(ix)**	$7\sqrt{3}$
(x)	$5\sqrt{5}$	**(xi)**	$9\sqrt{7}$	**(xii)**	$4\sqrt{7}$

[12 marks]

Answer 3

(i)	$15\sqrt{2}$	**(ii)**	$20\sqrt{3}$	**(iii)**	$15\sqrt{6}$
(iv)	$12\sqrt{5}$	**(v)**	$20\sqrt{7}$	**(vi)**	$14\sqrt{5}$

[6 marks]

Answer 4

(i)	$\sqrt{11}$	**(ii)**	$\sqrt{6}$	**(iii)**	$2\sqrt{2}$
(iv)	$3\sqrt{3}$	**(v)**	$3\sqrt{2}$	**(vi)**	$5\sqrt{2}$

[6 marks]

Answer 5

(i) 7 **(ii)** 10 **(iii)** 3

[3 marks]

Answer 6

(i) $\sqrt{2}$ **(ii)** $\sqrt{2}$ **(iii)** $2\sqrt{2}$

[3 marks]

Answer 7

(i) $19\sqrt{3}$

(ii) $10\sqrt{2}$

(iii) $3\sqrt{5}$

(iv) $25\sqrt{6}$

[8 marks]

Answer 8

(i) $15\sqrt{7}$ **(ii)** $70\sqrt{2}$

(iii) $60\sqrt{6}$ **(iv)** $6\sqrt{10}$

(v) $55\sqrt{15}$ **(vi)** $144\sqrt{2}$

[6 marks]

Answer 9

(i) $6 + 5\sqrt{7}$ **(ii)** $1 + 5\sqrt{2}$

(iii) $3 + 4\sqrt{6}$ **(iv)** $4 + 2\sqrt{10}$

(v) $6 - 11\sqrt{15}$ **(vi)** $4 + 16\sqrt{2}$

[12 marks]

Answer 10

(i) $40 + 6\sqrt{10}$

(ii) $-2 + \sqrt{22}$

(iii) $1 + 3\sqrt{39}$

[6 marks]