3.3 Answers

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

3.3.1 Solutions (3.1 Introductory Example)

Multiply both numerator and denominator by $\sqrt{5}$

$$= \frac{4\sqrt{3}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$$

$$= \frac{4\sqrt{15}}{5} \qquad \left(0.8\sqrt{15} \right)$$

[2 marks]

3.3.2 Solutions (3.2 Exercise)

Answer 1

(i) $4\sqrt{5}$ **(ii)** $4\sqrt{7}$ **(iii)** $12\sqrt{6}$

(iv) $4\sqrt{3}$ **(v)** $\frac{5\sqrt{13}}{13}$ **(vi)** $7\sqrt{6}$

(vii) $5\sqrt{11}$ (viii) $\frac{\sqrt{2}}{2}$ (ix) $\sqrt{30}$

[9 marks]

Answer 2

$\frac{5\sqrt{2}}{16}$

[1 mark]

Answer 3

(i) $\frac{4\sqrt{13}}{3}$ **(ii)** $\frac{8\sqrt{6}}{5}$ **(iii)** $\frac{7\sqrt{15}}{45}$

(iv) $\frac{11\sqrt{3}}{36}$ **(v)** $\frac{3\sqrt{6}}{7}$ **(vi)** $\frac{3\sqrt{7}}{7}$

(vii) $\frac{4\sqrt{11}}{5}$ **(viii)** $7\sqrt{2}$ **(ix)** $\frac{2\sqrt{14}}{3}$

[9 marks]

Answer 4

proof

Answer 5

$\sqrt{5}$

Answer 6

$2\sqrt{6}$

[2, 2, 3 marks]

Answer 7

(a) y^2

[1 mark]

(b) $8y$

[1 mark]

(c) $\dfrac{64}{y^4}$

[2 marks]

Answer 8

(a)

$$y^{-\frac{1}{2}} = \left(\frac{64\,x^6}{25} \right)^{-\frac{1}{2}}$$

$$= \left(\frac{25}{64\,x^6} \right)^{\frac{1}{2}}$$

$$= \frac{5}{8\,x^3}$$

$$= \frac{5}{8}\,x^{-3}$$

[3 marks]

(b)

$$(25\,y)^{\frac{2}{3}} = 16\,x^4$$

[2 marks]