

Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- add the indices: $x^5 \times x^3 = \mathbf{x^8}$

2.2

- $2^{-3} = \frac{1}{2^3} = \frac{\mathbf{1}}{\mathbf{8}}$

2.3

- $81^{\frac{1}{2}} = \sqrt{81} = \mathbf{9}$

3.1

- $(2a^2)^3 = 2^3 a^6$
- $\mathbf{8a^6}$

3.2

- $27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2$
- $\mathbf{9}$

3.3

- $16^{-\frac{1}{2}} = \frac{1}{\sqrt{16}}$
- $\frac{\mathbf{1}}{\mathbf{4}}$

3.4

(a)

(i)

- $\frac{x^7 \times x^{-3}}{x^2} = \frac{x^4}{x^2} = \mathbf{x^2}$

(ii)

- $(2y^3)^4 = 2^4 y^{12} = \mathbf{16y^{12}}$

(b)

(i)

- $27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2 = \mathbf{9}$

(ii)

- $\left(\frac{25}{4}\right)^{-\frac{1}{2}} = \left(\frac{4}{25}\right)^{\frac{1}{2}} = \frac{\mathbf{2}}{\mathbf{5}}$

(c)

- $\frac{1}{32} = 2^{-5}$
- $x + 1 = -5$
- $\mathbf{x = -6}$

(d)

- $\frac{a^n}{a^n} = a^{n-n} = a^0$ by the division law
- any non-zero number divided by itself is 1, so $\mathbf{a^0 = 1}$