Fully-Worked Solutions

PRACTICE 1

Section A

1 $p \times p \times p \times p \times p = p^5$
Answer: **C**

2 $6 \times 6 \times 6 \times 6 \times 6 \times 6 = 6^6$
Answer: **D**

3 $4\,096 = 16 \times 16 \times 16 = 16^3$
Answer: **D**

4 $\left(-2\frac{2}{3}\right)^3 = \left(-\frac{8}{3}\right)^3$

$= -\frac{(8)^3}{(3)^3}$

$= -\frac{512}{27}$

Answer: **B**

5 $-2y^4 \times 4y^3 \times y^5 = -8y^{12}$
Answer: **A**

6 $4m^5 \times 6m^7 = 24m^{12}$
Answer: **C**

7 $\left(2k^{\frac{1}{3}}\right)^6 = 64\,k^2$
Answer: **B**

8 $w^8 = (w^4)^2$
Answer: **A**

9 $(4x^2y^{-1})^3 \div 2xy^2 = \frac{4^3x^6y^{-3}}{2xy^2}$

$= \frac{4^3}{2}\left(\frac{x^6}{x}\right)\left(\frac{y^{-3}}{y^2}\right)$

$= \frac{64}{2}(x^5)(y^{-5})$

$= 32x^5y^{-5}$

Answer: **A**

10 $\frac{(p^2q^4)^{-1}}{p^{-4}q^3} = \frac{p^{-2}q^{-4}}{p^{-4}q^3}$

$= p^{-2-(-4)}q^{-4-3}$

$= p^2q^{-7}$

Answer: **B**

11 $\frac{1}{x^n} = 4^{-2}$

$\frac{1}{x^n} = \frac{1}{4^2}$

$x = 4,\ n = 2$

Answer: **D**

12 $25^{\frac{3}{4}} = (25^3)^{\frac{1}{4}}$

$= \sqrt[4]{25^3}$

$m = 4\ ;\ n = 3$

Answer: **A**

13 $\sqrt{\left(\frac{5}{7}\right)^{-3}} = \sqrt{\frac{1}{\left(\frac{5}{7}\right)}}$

$= \sqrt{\left(\frac{7}{5}\right)^3}$

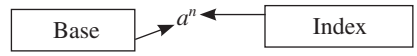
$= \left(\left(\frac{7}{5}\right)^3\right)^{\frac{1}{2}}$

$= \left(\frac{7}{5}\right)^{\frac{3}{2}}$

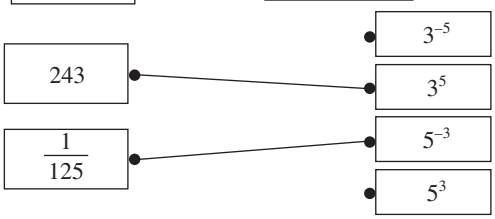
Answer: **A**

Section B

1 (a)



(b)



2 (a) (i) $2\frac{10}{27} = \frac{64}{27} = \left(\frac{\boxed{4}}{\boxed{3}}\right)^3$

(ii) $\frac{625}{256} = \left(\frac{5}{4}\right)^4 = \left(1\frac{1}{4}\right)^{\boxed{4}}$

(b) (i) $a \times a \times a \times a \times a \times a = a^5$ FALSE

(ii) $(-3) \times (-3) \times (-3) \times (-3) = 3^4$ TRUE

3 (a) $\sqrt[5]{m^3} = m^{\frac{\boxed{3}}{\boxed{5}}}$

(b) (i) $p^m \times p^{2m} = p^{2m^2}$ FALSE

(ii) $\sqrt[5]{m} = m^{\frac{1}{5}}$ TRUE

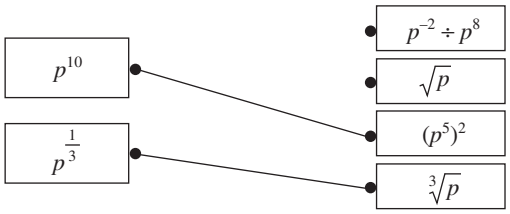
4 (a) (i) $5p^4 \times 3p^2 \div p^3 = 15p^3$ TRUE

(ii) $\left(-\frac{1}{p}\right)^{-3} = p^3$ FALSE

(b) $\sqrt[3]{m} \times m^2 = m^{\boxed{\frac{1}{3}}} \times m^2$

$= m^{\boxed{\frac{7}{3}}}$

5 (a)



(b) (i) $p^2 \times p^{-3} \times q^4 \times p^7 \times q^{-8} = p^{\boxed{6}} q^{-4}$

(ii) $\dfrac{x^{-5}y^2}{y^7x^{-7}} = x^{\boxed{2}} y^{-5}$

Section C

1 (a) $\sqrt[5]{p^3} = (p^3)^{\frac{1}{5}} = p^{3 \times \frac{1}{5}} = p^{\frac{3}{5}}$

(b) (i) $\left(\dfrac{8}{27}\right)^{\frac{1}{3}} = \sqrt[3]{\dfrac{8}{27}} = \dfrac{\sqrt[3]{8}}{\sqrt[3]{27}} = \dfrac{2}{3}$

(ii) $6^{\frac{1}{2}} \times 3^{-\frac{1}{2}} \times (\sqrt{2})^3 = (2 \times 3)^{\frac{1}{2}} \times 3^{-\frac{1}{2}} \times 2^{\frac{3}{2}}$

$= 2^{\frac{1}{2}} \times 3^{\frac{1}{2}} \times 3^{-\frac{1}{2}} \times 2^{\frac{3}{2}}$

$= 2^{\frac{1}{2}+\frac{3}{2}} \times 3^{\frac{1}{2}-\frac{1}{2}}$

$= 2^2 \times 3^0$

$= 4 \times 1$

$= 4$

(c) After 1 year

= RM1 000 + RM1 000 × 2.5%

= RM1 000 + RM1 000 × 0.025

= RM1 000 × 1.025

After 2 years

= RM1 000 × 1.025 × 1.025

= RM1 000 × 1.025^2

After 3 years

= RM1 000 × 1.025^2 × 1.025

= RM1 000 × 1.025^3

Thus, Jerrine's total savings after 10 years

= RM1 000 × 1.025^{10}

= RM1 280.08

2 (a) (i) $\dfrac{m^{\frac{5}{2}}m^3}{\sqrt{m}} = \dfrac{m^{\frac{5}{2}+3}}{m^{\frac{1}{2}}}$

$= m^{\frac{5}{2}+3-\frac{1}{2}}$

$= m^5$

(ii) $(3^6 \times 27)^{\frac{1}{3}} \div \left(k^{\frac{1}{4}}\right)^4 = (3^6 \times 3^3)^{\frac{1}{3}} \div k$

$= 3^2 \times 3 \div k$

$= \dfrac{27}{k}$

(b) $\dfrac{3^{\frac{1}{2}} \times 12^{\frac{1}{2}}}{27^{\frac{2}{3}}} = \dfrac{(3 \times 12)^{\frac{1}{2}}}{(3^3)^{\frac{2}{3}}}$

$= \dfrac{36^{\frac{1}{2}}}{3^2}$

$= \dfrac{(6^2)^{\frac{1}{2}}}{3^2}$

$= \dfrac{6}{9}$

$= \dfrac{2}{3}$

(c) (i) $5^x = 125$

$5^x = 5^3$

$x = 3$

(ii) $p^3p^{2x} = p^0$

$p^{3+2x} = p^0$

$3 + 2x = 0$

$2x = -3$

$x = -\dfrac{3}{2}$

3 (a) $(w^3)^{\frac{1}{2}} \div \dfrac{1}{\sqrt{w}} = (w^3)^{\frac{1}{2}} \times \sqrt{w}$

$= w^{\frac{3}{2}} \times w^{\frac{1}{2}}$

$= w^{\frac{3}{2}+\frac{1}{2}}$

$= w^2$

(b) (i) $3^{2x-1} = 3^x3^4$

$3^{2x-1} = 3^{x+4}$

$2x - 1 = x + 4$

$2x - x = 4 + 1$

$x = 5$

(ii) $2^{x-5} = 16$

$2^{x-5} = 2^4$

$x - 5 = 4$

$x = 9$

(c) Investment value after 5 years

= 8 000(1.12^5)

= RM14 099

Profit

= RM14 099 – RM8 000

= RM6 099