

Topic: Indices

$$07.01 \quad x^2 y^4 \div x^{-3} y^6$$

$$= x^{2-(-3)} y^{4-(6)}$$

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

$$07.02 \quad m^5 \times m^{-8}$$

$$= m^{5+(-8)}$$

$$= m^{-3}$$

$$= \frac{1}{m^3}$$

$$07.03 \quad m^3 \times \sqrt{m}$$

$$= m^3 \times m^{1/2}$$

$$= m^{3+1/2}$$

$$= m^{7/2}$$

$$\begin{aligned} & \frac{3}{1} + \frac{1}{2} \\ &= \frac{6+1}{2} \\ &= \frac{7}{2} \end{aligned}$$

$$07.04 \quad 8^{2/3}$$

$$= \left(\sqrt[3]{8} \right)^2$$

$$= (2)^2$$

$$= 4$$

Note
 $2 \times 2 \times 2$
 $= 8$

$$07.05 \quad k^8 \times (k^2)^{-3}$$

$$= k^8 \times k^{2 \times -3}$$

$$= k^8 \times k^{-6}$$

$$= k^{8+(-6)}$$

$$= k^2$$

$$07.06 \quad 9^{3/2}$$

$$= \left(\sqrt{9} \right)^3$$

$$= (3)^3$$

$$= 27$$

Topic: Indices

07-07

$$2^0 + 3^{-1}$$

$$= 1 + \frac{1}{3}$$

$$= 1\frac{1}{3} \text{ or } \frac{4}{3}$$

07-08

$$y^8 \times (y^3)^{-2}$$

$$= y^8 \times y^{3 \times -2}$$

$$= y^8 \times y^{-6}$$

$$= y^{8+(-6)}$$

$$= y^2$$

07-09

$$a^{2/3} (a^{2/3} - a^{-2/3})$$

$$(a^{2/3} \times a^{2/3}) - (a^{2/3} \times a^{-2/3})$$

$$= a^{2/3+2/3} - a^{2/3+(-2/3)}$$

$$= a^{4/3} - a^0$$

$$= a^{4/3} - 1$$

07-10

$$p^3 (p^2 - p^{-3})$$

$$= (p^3 \times p^2) - (p^3 \times p^{-3})$$

$$= p^{3+2} - p^{3+(-3)}$$

$$= p^5 - p^0$$

$$= p^5 - 1$$

07-11

$$x^{1/2} (3x + x^{-2})$$

$$= (x^{1/2} \times 3x) + (x^{1/2} \times x^{-2})$$

$$= 3x^{1+1/2} + x^{1/2+(-2)}$$

$$= 3x^{3/2} + x^{-3/2}$$

$$\frac{1}{2} - \frac{2}{1}$$

$$= \frac{1-4}{2}$$

$$= -\frac{3}{2}$$

07-12

$$m^{1/2} (2 + m^2)$$

$$= (m^{1/2} \times 2) + (m^{1/2} \times m^2)$$

$$= 2m^{1/2} + m^{1/2+2}$$

$$= 2m^{1/2} + m^{5/2}$$

$$\frac{1}{2} + \frac{2}{1}$$

$$= \frac{1+4}{2}$$

$$= \frac{5}{2}$$

Topic: Indices

07.13

$$a^{1/2} \left(a + \frac{1}{a} \right)$$

$$= (a^{1/2} \times a^1) + (a^{1/2} \times a^{-1})$$

$$= a^{1/2+1} + a^{1/2+(-1)}$$

$$= a^{3/2} + a^{-1/2}$$

$$\begin{aligned} \frac{1}{2} + 1 &= \frac{3}{2} \\ \frac{1}{2} - 1 &= \frac{-1}{2} \end{aligned}$$

07.14

$$b^{1/2} (b^{1/2} + b^{-1/2})$$

$$= (b^{1/2} \times b^{1/2}) + (b^{1/2} \times b^{-1/2})$$

$$= b^{1/2+1/2} + b^{1/2+(-1/2)}$$

$$= b^{2/2} + b^0$$

$$= b + 1$$

07.15

$$\frac{n^5 \times 10n}{2n^2}$$

$$= \frac{10n^{5+1}}{2n^2}$$

$$= \frac{5n^6}{n^2}$$

$$= 5n^{6-2}$$

$$= 5n^4$$

07.16

$$\frac{3a^5 \times 2a}{a^2}$$

$$= \frac{6a^{5+1}}{a^2}$$

$$= \frac{6a^6}{a^2}$$

$$= 6a^{6-2}$$

$$= 6a^4$$

07.17

$$\frac{ab^6}{a^3b^2}$$

$$= a^{1-3} b^{6-2}$$

$$= a^{-2} b^4$$

$$\text{or } \frac{b^4}{a^2}$$

07.18

$$\frac{y^4 \times y}{y^{-2}}$$

$$= \frac{y^{4+1}}{y^{-2}}$$

$$= y^{5-(-2)}$$

$$= y^7$$

Topic: Indices

07.19

$$\frac{m^5}{m^3}$$

$$= m^{5-3}$$

$$= m^2$$

07.20

$$\frac{3y^5 \times 4y^{-1}}{6y}$$

$$= \frac{12y^{5+(-1)}}{6y}$$

$$= 2y^{4-1}$$

$$= 2y^3$$

07.21

$$\frac{b^{1/2} \times b^{3/2}}{b}$$

$$= \frac{b^{1/2+3/2}}{b}$$

$$= \frac{b^{4/2}}{b} \Rightarrow \frac{b^2}{b^1}$$

$$= b$$