Year 10 Indices Test   **Name:**

Express all answers with positive indices

Simplify:

(a) $7g^5h^4 \times 2g^2h^{-3}$

$$= 7 \times 2 \times g^{5+2} \times h^{4-3}$$

$$= 14g^7h$$

(b) $72p^5t^{-1} \div 3p^{14}t^3$

$$\frac{72p^5t^{-1}}{3p^{14}t^3} = \frac{24}{p^{14-5}t^{3-(-1)}} = \frac{24}{p^9t^4}$$

(c) $2g^3h^5 \times (-6)g^2h^2$

$$= 2 \times (-6) \times g^{3+2} \times h^{5+2}$$

$$= -12g^5h^7$$

(d) $-28p^5t^3 \div (-7)p^3t^5$

$$\frac{(-28)p^5t^3}{(-7)p^3t^5} = \frac{4p^{5-3}}{t^{5-3}} = \frac{4p^2}{t^2}$$

(e) $(5a^{-3})^2$

$$= 5^2(a^{-3})^2$$

$$= 25a^{-3\times2} = 25a^{-6} = \frac{25}{a^6}$$

(f) $(a^{-4}b^3)^5$

$$= (a^{-4})^5 \times (b^3)^5$$

$$= a^{-4\times5} \times b^{3\times5} = a^{-20}b^{15} = \frac{b^{15}}{a^{20}}$$

(g) $\left(\frac{a^{-5}b}{c^{-3}}\right)^2$

$$= \frac{a^{-5\times2}b^2}{c^{-3\times2}} = \frac{c^6b^2}{a^{10}}$$

(h) $c^{\frac{2}{5}} \times c^{\frac{1}{4}}$

$$= c^{2/5 + 1/4} = c^{8/20 + 5/20} = c^{13/20}$$

(i) $a^{\frac{3}{4}} \times a^{\frac{2}{3}}$

$$a^{3/4} \times a^{2/3} = a^{9/12 + 8/12}$$

$$= a^{17/12}$$

(j) $6^{-2}a^2b^{-5}$

$$= \frac{a^2}{6^2b^5} = \frac{a^2}{36b^5}$$

Evaluate:

(a) 2^{-3}.

$$= \frac{1}{2^3} = \frac{1}{8} = 0.125$$

(b) $3 \times 25^{0.5}$.

$$3 \times \sqrt{25} = 3 \times 5$$

$$= 15$$

(c) $5 \times 8^{\frac{1}{3}}$

$$5 \times \sqrt[3]{8}$$

$$= 5 \times 2$$

$$= 10$$

(d) 2^{10}

$$2^{10} = 1024$$

(e) $5 \times \left(512^{\frac{1}{3}}\right)^{\frac{1}{3}}$

$$5 \times \left((2^9)^{1/3}\right)^{1/3}$$

$$= 5 \times (2^3)^{1/3}$$

$$= 5 \times 2^1$$

$$= 10.$$