

$$1a) r^{-3} = \frac{1}{r^3}$$

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

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

$$2a) \begin{array}{c} a^0 + 9b^0 \\ \downarrow \\ | + 9| \\ | + 9 \\ 10 \end{array}$$

$$2b) \begin{array}{c} -7^0 \\ \downarrow \\ -1 \end{array}$$

3)

$$\frac{v^{-5}w^4}{v^7w^{-10}} = \frac{w^4w^{10}}{v^5v^7} = \frac{w^{14}}{v^{12}}$$

4)

$$(-4x^{10}y^{-2})(5x^{-7}y^{-6})$$

$$-20x^{10-7}y^{-2-6}$$

$$-20x^3y^{-8} = \frac{-20x^3}{y^8}$$

5)

$$\left(\frac{x^{-12}y^1}{x^8y^{-6}z^3}\right)^2 = \left(\frac{y^1y^6}{x^{12}x^8z^3}\right)^2 = \left(\frac{y^7}{x^{20}z^3}\right)^2 = \frac{y^{14}}{x^{40}z^6}$$

6)

$$\left(\frac{5m^{-1}n^3}{mn}\right)^{-2} = \left(\frac{m^1n}{5m^{-1}n^3}\right)^2 = \left(\frac{mm}{5n^2}\right)^2 = \left(\frac{m^2}{5n^2}\right)^2 = m$$

7)

$$\left(\frac{c^{-3}d^{-5}}{c^{-2}d^{-9}}\right)^3$$

$$8a) x^{-9}x^5x^{-7}$$

$$8b) 4^5 \cdot 4^{-7}$$

9)

$$(5x^3y^0)^{-2}$$

$$10) 2^{-3} + 8^{-1}$$

$$11a) 6x^{-4}y^2$$

$$11b) \frac{3}{r^{-7}}$$