

Q1 Simplify $\left(\frac{12a^3b^4}{9a^5b^{-2}}\right)^0$

$$= \left(\frac{4 \cdot \cancel{3} b^2 b^4}{3 \cdot \cancel{3} a^5 a^3}\right)^0 = \left(\frac{4b^6}{3a^8}\right)^0 = \boxed{\frac{4b^6}{3a^8}}$$

Q2 Simplify $\sqrt[3]{24xy^3} - \sqrt[3]{81xy^3}$

$$= \sqrt[3]{24xy^3 - 81xy^3} = \sqrt[3]{-57xy^3}$$

$$= \sqrt[3]{-27} \cdot \sqrt[3]{2} \cdot \sqrt[3]{x} \cdot \sqrt[3]{y^3}$$

$$= -3 \cdot \sqrt[3]{2} \cdot \sqrt[3]{x} \cdot y = \boxed{3y\sqrt[3]{2x}}$$

Q3 Expand $(5x^2 - 3)^2 =$

$$(5x^2)^2 - 3^2 =$$

$$\boxed{25x^4 - 9}$$

Q4 Factor $36x^2 + 49y^2 =$

$$\begin{array}{cccc} / & \backslash & / & \backslash \\ 6x & 6x & 7y & 7y \end{array}$$

$$(6x + 7y)(6x + 7y) =$$

$$\boxed{(6x + 7y)^2}$$

Q5 Simplify $\frac{1 - \frac{1}{x}}{xy} =$

$$= \frac{\frac{x}{x} \cdot 1 - \frac{1}{x}}{\frac{xy}{1}} = \frac{\frac{x}{x} - \frac{1}{x}}{\frac{xy}{1}} = \frac{\frac{x-1}{x}}{\frac{xy}{x}} =$$

$$= \frac{x}{x-1} \cdot \frac{xy}{1} = \frac{x \cancel{x} y}{x-1} = \frac{xy}{-1} = \boxed{-xy}$$

Q6 Solve $5x - (2x + 2) = 2(3x - 5) + x$

$$5x - 2x + 2 = 6x - 10 + 2x$$

$$3x + 2 = 8x - 10$$

$$2 = 5x - 10$$

$$\boxed{12/5 = 5x}$$

Q7 Simplify $5\sqrt{-8} + 3\sqrt{-18}$

$$= 5\sqrt{-4}\sqrt{2} + 3\sqrt{-9}\sqrt{2}$$

$$= 5(-2i)\sqrt{2} + 3(-3i)\sqrt{2}$$

$$= -10i\sqrt{2} - 9i\sqrt{2}$$

$$= \boxed{-19i\sqrt{2}}$$