Simplify completely, writing your final answer with only positive integer exponents. Note: there are several correct ways to work these problems. I will present two ways for the first problem. Your solution is correct if each step is mathematically correct.

1) One way:

$$\begin{aligned}\frac{4xy^{-2}z^3}{12x^{-1}y^5z} &= \frac{4}{12}\frac{x}{x^{-1}}\frac{y^{-2}}{y^5}\frac{z^3}{z} \\ &= \frac{1}{3}x^{1-(-1)}y^{-2-5}z^{3-1} \\ &= \frac{1}{3}x^2y^{-7}z^2 \\ &= \frac{x^2z^2}{3y^7}\end{aligned}$$

Another way:

$$\begin{aligned}\frac{4xy^{-2}z^3}{12x^{-1}y^5z} &= \frac{4x\cdot xz^3}{12y^2y^5z} \\ &= \frac{x^2z^3}{3y^7z} \\ &= \frac{x^2z^2}{3y^7}\end{aligned}$$

In the last step, I am thinking that the z in the denominator cancels one factor of z in the numerator. Remember that when the exponent is a positive integer (natural number), it tells you how many factors of the base there are.

2)

$$\begin{aligned}\left(\frac{5x}{2y^3}\right)^{-3} &= \left(\frac{2y^3}{5x}\right)^3 \\ &= \frac{2^3\left(y^3\right)^3}{5^3x^3} \\ &= \frac{8y^9}{125x^3}\end{aligned}$$