

Solution

$$a) \frac{0.015 \times 0.567}{0.05 \times 0.189}$$

Run the decimal point to the right side to get whole number for easy calculation:

$$= \frac{15 \times 10^{-3} \times 567 \times 10^{-3}}{5 \times 10^{-2} \times 189 \times 10^{-3}}$$

Cancellation will take place here, 5 will go into 15 = 3times and 189 will go into 189 = 3times. Which will give us:

$$= \frac{3 \times 10^{-3} \times 3 \times 10^{-3}}{1 \times 10^{-2} \times 1 \times 10^{-3}}$$

Group like terms

$$= \frac{3 \times 3 \times 10^{-3} \times 10^{-3}}{1 \times 1 \times 10^{-2} \times 10^{-3}}$$

Multiple like terms

$$\frac{9 \times 10^{-3} \times 10^{-3}}{1 \times 10^{-2} \times 10^{-3}}$$

Indices first law will be applied here. Which says “ $a^2 \times a^3 = a^{2+3} = a^5$ ” If the bases are the same add the exponent:

$$\frac{9 \times 10^{-3+(-3)}}{1 \times 10^{-2+(-3)}}$$

$$\frac{9 \times 10^{-6}}{1 \times 10^{-5}}$$

Indices second law will be applied here. Which says “ $\frac{a^2}{a^3} = a^{2-3} = a^{-1}$ ” If the bases are the same subtract the exponent:

$$9 \times 10^{-6 - (-5)}$$

$$9 \times 10^{-1}$$

$$\therefore \frac{0.015 \times 0.567}{0.05 \times 0.189} = 9 \times 10^{-1}$$

NB: Always leave your answer in standard form.