Exponents And Powers

Exercise 4.1

Q. 1. A. Simplify and give reasons

4^{-3}

Answer :

Given, $= 4^{-3}$

$= \frac{1}{4^3}$

$\left(\because\ a^{-m} = \frac{1}{a^m}\right)$

$= \frac{1}{4\times4\times4}$

$= \frac{1}{64}$

$\therefore 4^{-3} = \frac{1}{64}$

Q. 1. B. Simplify and give reasons

$(-2)^7$

Answer : Given, $= (-2)^7$

$= -(2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2) \because (-2)^7 = 1 - (2)^7$

$= -128$

$\therefore (-2)^7 = -128$

Q. 1. C. Simplify and give reasons

$(\frac{3}{4})^{-3}$

Answer :

Given, $=(\frac{3}{4})^{-3}$

$= (\frac{4}{3})^{3} \because (\frac{a}{b})^{-m} = (\frac{b}{a})^{m}$

$= \frac{4\times4\times4}{3\times3\times3}$

$=\frac{64}{27}$

$\therefore (\frac{3}{4})^{-3} = \frac{64}{27}$

Q. 1. D. Simplify and give reasons

$(-3)^{-4}$

Answer :

Given, $=(-3)^{-4}$

$= \frac{1}{(-3)^4}$

$= \frac{1}{(-3)\times(-3)\times(-3)\times(-3)}$

$= \frac{1}{81}$

$\therefore (-3)^{-4} = \frac{1}{81}$

Q. 2. A. Simplify the following:

$$\left(\frac{1}{2}\right)^4 \times \left(\frac{1}{2}\right)^5 \times \left(\frac{1}{2}\right)^6$$

Answer :

To Find: $\left(\frac{1}{2}\right)^4 \times \left(\frac{1}{2}\right)^5 \times \left(\frac{1}{2}\right)^6$

We know that: $a^m \times a^n = a(m+n)$

Therefore, $\left(\frac{1}{2}\right)^4 \times \left(\frac{1}{2}\right)^5 \times \left(\frac{1}{2}\right)^6 = \left(\frac{1}{2}\right)^{4+5+6}$

$= \left(\frac{1}{2}\right)^{15}$

$= 2^{-15}$

Answer.

Q. 2. Simplify the following:

$(-2)^7 \times (-2)^3 \times (-2)^4$

Answer : Given, $= (-2)^7 \times (-2)^3 \times (-2)^4$

$= (-2)^{7+3+4} \quad \because a^m \times a^n = a^{m+n}$

$= (-2)^{14}$

$\therefore (-2)^7 \times (-2)^3 \times (-2)^4 = (-2)^{14}$

Q. 2. C. Simplify the following:

$$4^4 \times \left(\frac{5}{4}\right)^4$$

Answer :

Given, $= 4^4 \times \left(\frac{5}{4}\right)^4$

$= 4^4 \times \frac{5^4}{4^4} \quad \because \left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

$= 5^4$

$= 625$

Q. 2. D. Simplify the following:

$$\left(\frac{5^{-4}}{5^{-6}}\right)\times 5^3$$

Answer :

Given, $= \left(\frac{5^{-4}}{5^{-6}}\right)\times 5^3$

$= \frac{5^6}{5^4} \times 5^3 \because\ a^{-m} = \frac{1}{a^m}$

$= \frac{5^6}{5^{4-3}}$

$= \frac{5^6}{5^1}$

$= 5^{6-1} \therefore\ \frac{a^m}{a^n} = a^{m-n}$

$= 5^5$

$= 625$

$\therefore \left(\frac{5^{-4}}{5^{-6}}\right)\times 5^3 = 625.$

Q. 2. E. Simplify the following:

$(-3)^4 \times 7^4$

Answer : Given, = $(-3)^4 \times 7^4$

$= (-3) \times (-3) \times (-3) \times (-3) \times 7 \times 7 \times 7 \times 7$

$= 9 \times 9 \times 2401$

$= 194,481$

$\therefore (-3)^4 \times 7^4 = 194,481$

Q. 3. A. Simplify

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

Answer :

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

$= 2^2 \times \frac{3^2}{2^{-2}} \times 3^{-1} \qquad \left(\because a^{-m} = \frac{1}{a^m}\right)$

$= 2^{2-(-2)} \times 3^{2-1} \qquad (\because a^m \times a^n = a^{m+n})$

$= 2^4 \times 3^1$

$= 16 \times 3$

$= 48$

$$\therefore 2^2 \times \frac{3^2}{2^{-2}} \times 3^{-1} = 48.$$

Q. 3. B. Simplify

$(4^{-1} \times 3^{-1}) \div 6^{-1}$

Answer : Given, $= (4^{-1} \times 3^{-1}) \div 6^{-1}$

$$= \frac{1}{4^1} \times \frac{1}{3^1} \div \frac{1}{6^1} \quad \because \quad a^{-m} = \frac{1}{a^m}$$

$$= \frac{1}{4} \times \frac{1}{3} \times 6$$

$$= \frac{1}{12} \times 6$$

$$= \frac{1}{2}$$

$$\therefore (4^{-1} \times 3^{-1}) \div 6^{-1} = \frac{1}{2}$$

Q. 4. A. Simplify and give reasons

$(4^0 + 5^{-1}) \times 5^2 \times \frac{1}{3}$

Answer :

Given, $=(4^0 + 5^{-1}) \times 5^2 \times \frac{1}{3}$

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

$=\frac{6}{5}\times 5^2 \times \frac{1}{3}$

$= 2\times 5^{2-1}$

$= 2\times 5$

$= 10$

$\therefore (4^0 + 5^{-1}) \times 5^2 \times \frac{1}{3} = 10$

Q. 4. B. Simplify and give reasons

$$\left(\frac{1}{2}\right)^{-3} \times \left(\frac{1}{4}\right)^{-3} \times \left(\frac{1}{5}\right)^{-3}$$

Answer :

Given, $= \left(\frac{1}{2}\right)^{-3} \times \left(\frac{1}{4}\right)^{-3} \times \left(\frac{1}{5}\right)^{-3} \because (\frac{a}{b})^m = \frac{a^m}{b^m}$

$= \frac{1}{2^{-3}} \times \frac{1}{4^{-3}} \times \frac{1}{5^{-3}}$

$= 2^3 \times 4^3 \times 5^3 \because a^{-m} = \frac{1}{a^m}$

$= 2^3 \times (2^2)^3 \times 5^3 \because (a^m)^n = a^{m \times n}$

$= 2^3 \times 2^6 \times 5^3$

$= 2^{3+6} \times 5^3 \because a^m \times a^n = a^{m+n}$

$= 2^9 \times 5^3$

$\therefore \left(\frac{1}{2}\right)^{-3} \times \left(\frac{1}{4}\right)^{-3} \times \left(\frac{1}{5}\right)^{-3} = 2^9 \times 5^3$

Q. 4. C. Simplify and give reasons

$$(2^{-1} + 3^{-1} + 4^{-1}) \times \frac{3}{4}$$

Answer :

Given, $= (2^{-1} + 3^{-1} + 4^{-1}) \times \frac{3}{4}$

$= (\frac{1}{2} + \frac{1}{3} + \frac{1}{4}) \times \frac{3}{4} \because a^{-m} = \frac{1}{a^m}$

$= (\frac{6+4+3}{12}) \times \frac{3}{4}$

$= \frac{13}{12} \times \frac{3}{4}$

$= \frac{13}{4} \times \frac{1}{4}$

$= \frac{13}{16}$

$\therefore (2^{-1} + 3^{-1} + 4^{-1}) \times \frac{3}{4} = \frac{13}{16}$

Q. 4. D. Simplify and give reasons

$$\frac{3^{-2}}{3} \times (3^0 - 3^{-1})$$

Answer :

Given, $= \frac{3^{-2}}{3} \times (3^0 - 3^{-1})$

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

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

$= \frac{2}{3^{3+1}}$

$= \frac{2}{3^4}$

$= \frac{2}{81}$

$\therefore \frac{3^{-2}}{3} \times (3^0 - 3^{-1}) = \frac{2}{81}$

Q. 4. E. Simplify and give reasons

$1 + 2^{-1} + 3^{-1} + 4^0$

Answer : Given, $= 1 + 2^{-1} + 3^{-1} + 4^0$

$= 1 + \frac{1}{2} + \frac{1}{3} + 1 \because a^{-m} = \frac{1}{a^m}$

$= \frac{6+3+2+6}{6}$

$= \frac{17}{6}$

$\therefore 1 + 2^{-1} + 3^{-1} + 4^0 = \frac{17}{6}$

Q. 4. F. Simplify and give reasons

$$\left[\left(\frac{3}{2}\right)^{-2}\right]^2$$

Answer :

Given, $= \left[\left(\frac{3}{2}\right)^{-2}\right]^2$

$= [(\frac{2}{3})^2]^2$

$= (\frac{2}{3})^4 \therefore (a^m)^n = a^{m \times n}$

$= \frac{2^4}{3^4} \because (\frac{a}{b})^m = \frac{a^m}{b^m}$

$\therefore \left[\left(\frac{3}{2}\right)^{-2}\right]^2 = \frac{2^4}{3^4}$

Q. 5. A. Simplify and give reasons

$$\left[(3^2-2^2)\div\frac{1}{5}\right]^2$$

Answer :

Given, $= \left[(3^2-2^2)\div\frac{1}{5}\right]^2$

$= [(9-4)\times 5]^2$

$= [5\times 5]^2$

$= [5^2]^2$

$= 5^4$

$=625$

$\therefore \left[(3^2-2^2)\div\frac{1}{5}\right]^2 = 625$

Q. 5. B. Simplify and give reasons

$((5^2)^3 \times 5^4) \div 5^6$

Answer : Given, $= ((5^2)^3 \times 5^4) \div 5^6$

$= (5^6 \times 5^4) \times \frac{1}{5^6}$

$= (5^6 \times 5^4 \times 5^{-6})$

$= 5^{6+4-6}$

$= 5^4$

$= 625$

$\therefore ((5^2)^3 \times 5^4) \div 5^6 = 625$

Q. 6. A. Find the value of 'n' in each of the following:

$$\left(\frac{2}{3}\right)^3 \times \left(\frac{2}{3}\right)^5 = \left(\frac{2}{3}\right)^{n-2}$$

Answer :

Given, $\left(\frac{2}{3}\right)^3 \times \left(\frac{2}{3}\right)^5 = \left(\frac{2}{3}\right)^{n-2}$

$\frac{2^3}{3^3} \times \frac{2^5}{3^5} = (\frac{2}{3})^{n-2}$

$\frac{2^{3+5}}{3^{3+5}} = (\frac{2}{3})^{n-2}$

$(\frac{2}{3})^8 = (\frac{2}{3})^{n-2}$

$\Longrightarrow$ Comparing powers of $\frac{2}{3}$, we get

$\Longrightarrow n-2=8$

$\Rightarrow n=8+2$

$\Rightarrow n=10$

Q. 6. B. Find the value of 'n' in each of the following:

$(-3)^{n+1} \times (-3)^5 = (-3)^{-4}$

Answer : Given, $(-3)^{n+1} \times (-3)^5 = (-3)^{-4}$

$(-3)^{n+1+5} = (-3)^{-4}$

$(-3)^{n+6} = (-3)^{-4}$

$\Rightarrow$ Comparing powers of (-3), we get

$\Rightarrow n+6 = -4$

$\Rightarrow n = -4 - 6$

$\Rightarrow n = -10$

Q. 6. C. Find the value of 'n' in each of the following:

$7^{2n+1} \div 49 = 7^3$

Answer : Given, $7^{2n+1} \div 49 = 7^3$

$7^{2n+1} \times \frac{1}{49} = 7^3$

$7^{2n+1} \times \frac{1}{7^2} = 7^3$

$7^{2n+1} \times 7^{-2} = 7^3$

$7^{2n+1-2} = 7^3$

$7^{2n-1} = 7^3$

$\Rightarrow$ By comparing powers of 7, we get

$\Rightarrow 2n-1 = 3$

$\Rightarrow 2n = 3+1$

$\Rightarrow 2n = 4$

$\Rightarrow n = \frac{4}{2}$

$\Rightarrow n = 2$

Q. 7.

Find 'x' if $2^{-3} = \frac{1}{2^x}$

Answer :

Given, $2^{-3} = \frac{1}{2^x}$

Then, find the value of x.

$\Rightarrow 2^{-3} = \frac{1}{2^x}$

$2^{-3} = 2^{-x}$

$\Rightarrow$ By comparing the powers of 2, we get

$\Rightarrow -x = -3$

$\Rightarrow x = 3$

Q. 8

Simplify $\left[\left(\frac{3}{4}\right)^{-2} \div \left(\frac{4}{5}\right)^{-3}\right] \times \left(\frac{3}{5}\right)^{-2}$

Answer :

Given, $= \left[\left(\frac{3}{4}\right)^{-2} \div \left(\frac{4}{5}\right)^{-3}\right] \times \left(\frac{3}{5}\right)^{-2}$

$= [\frac{3^{-2}}{4^{-2}} \div \frac{4^{-3}}{5^{-3}}] \times \frac{3^{-2}}{5^{-2}}$

$= \frac{3^{-2}}{4^{-2}} \times \frac{5^{-3}}{4^{-3}} \times \frac{3^{-2}}{5^{-2}}$

$= \frac{3^{-2-2} \times 5^{-3+2}}{4^{-2-3}}$

$= \frac{3^{-2-2} \times 5^{-3+2}}{4^{-2-3}}$

$= \frac{3^{-4} \times 5^{-1}}{4^{-5}}$

$= \frac{4^{5}}{3^{4} \times 5^{1}}$

$\therefore \left[\left(\frac{3}{4}\right)^{-2} \div \left(\frac{4}{5}\right)^{-3}\right] \times \left(\frac{3}{5}\right)^{-2} = \frac{4^{5}}{3^{4} \times 5}$

Q. 9. A. If m = 3 and n = 2 find the value of

$9m^2 – 10n^3$

Answer : Given, = $9m^2 – 10n^3$

Where, m = 3 and n = 2

$= 9 \times 3^2 – 10 \times 2^3$

$= (9 \times 9) – (10 \times 8)$

$= 81 – 80$

$= 1$

$\therefore 9m^2 – 10n^3 = 1$

Q. 9. B. If m = 3 and n = 2 find the value of

$2m^2 n^2$

Answer : Given, = $2m^2 n^2$

$\Longrightarrow m = 3 \text{ and } n = 2$

$\Longrightarrow 2m^2 n^2 = 2 \times 3^2 \times 2^2$

$= 2 \times 9 \times 4$

$= 72$

$\therefore 2m^2 n^2 = 72$

Q. 9. C. If m = 3 and n = 2 find the value of

$2m^3 + 3n^2 – 5m^2 n$

Answer : Given, = $2m^3 + 3n^2 – 5m^2 n$

$= 2\times3^3 + 3\times2^2 - 5\times3^2\times2$

$= 54 + 12 - 90$

$= -24$

$\therefore 2m^3 + 3n^2 - 5m^2n = -24$

Q. 9. D. If m = 3 and n = 2 find the value of

$m^n - n^m$

Answer : Given, $= m^n - n^m$

$= 3^2 - 2^3$

$= 9 - 8$

$= 1$

$\therefore m^n - n^m = 1$

Q. 10

Simplify and give reasons $\left(\frac{4}{7}\right)^{-5} \times \left(\frac{7}{4}\right)^{-7}$

Answer :

Given, $= \left(\frac{4}{7}\right)^{-5} \times \left(\frac{7}{4}\right)^{-7}$

$= \frac{4^{-5}}{7^{-5}} \times \frac{7^{-7}}{4^{-7}}$

$= \frac{4^{-5+7}}{7^{-5+7}}$

$= \frac{4^2}{7^2}$

$= (\frac{4}{7})^2$

$\therefore \left(\frac{4}{7}\right)^{-5} \times \left(\frac{7}{4}\right)^{-7} = (\frac{4}{7})^2$

Exercise 4.2

Q. 1. A. Express the following numbers in the standard form.

0.000000000947

Answer : Given, = 0.000000000947

$= 0.000000000947 \times \frac{10^{10}}{10^{10}}$

$= 9.47 \times \frac{1}{10^{10}}$

$= 9.47 \times 10^{-10}$

$\therefore 0.000000000947 = 9.47 \times 10^{-10}$

Q. 1. B. Express the following numbers in the standard form.

543000000000

Answer : Given, = 543000000000

$= 543000000000 \times \frac{10^{11}}{10^{11}}$

$= 5.43 \times 10^{11}$

$\therefore 9.47 \times 10^{-10} = 5.43 \times 10^{11}$

Q. 1. C. Express the following numbers in the standard form.

48300000

Answer : Given, = 48300000

$= 48300000 \times \frac{10^{7}}{10^{7}}$

$= 4.83 \times 10^{7}$

$\therefore 48300000 = 4.83 \times 10^{7}$

Q. 1. D. Express the following numbers in the standard form.

0.00009298

Answer : Given, = 0.00009298

$$= 0.00009298 \times \frac{10^7}{10^7}$$

$$= 9.28 \times \frac{1}{10^7}$$

$$= 9.28 \times 10^{-7}$$

$$\therefore 0.00009298 = 9.28 \times 10^{-7}$$

Q. 1. E. Express the following numbers in the standard form.

0.0000529

Answer : Given, = 0.0000529

$$= 0.0000529 \times \frac{10^5}{10^5}$$

$$= 5.29 \times 10^{-5}$$

$$\therefore 0.0000529 = 5.29 \times 10^{-5}$$

Q. 2. A. Express the following numbers in the usual form.

4.37×10^5

Answer : Given, = 4.37×10^5

$= 4.37 \times 100000$

$= 437000$

$\therefore 4.37 \times 10^5 = 437000.$

Q. 2. B. Express the following numbers in the usual form.

5.8×10^7

Answer : Given, $= 5.8 \times 10^7$

$= 5.8 \times 10000000$

$= 58000000$

$\therefore 5.8 \times 10^7 = 58000000.$

Q. 2. C. Express the following numbers in the usual form.

32.5×10^{-4}

Answer : Given, $= 32.5 \times 10^{-4}$

$= 32.5 \times \frac{1}{10000}$

$= 0.00325$

$\therefore 32.5 \times 10^{-4} = 0.00325$

Q. 2. D. Express the following numbers in the usual form.

3.71529×10^7

Answer : Given, $= 3.71529 \times 10^7$

$= 3.71529 \times 10000000$

$= 37152900$

$\therefore 3.71529 \times 10^7 = 37152900$

Q. 2. E .Express the following numbers in the usual form.

3789×10^{-5}

Answer : Given, $= 3789 \times 10^{-5}$

$= 3789 \times \frac{1}{100000}$

$= 0.03789$

∴ $3789 \times 10^{-5} = 0.03789$

Q. 2. F. Express the following numbers in the usual form.

24.36×10^{-3}

Answer : Given, $= 24.36 \times 10^{-3}$

$= 24.36 \times \frac{1}{10000}$

$= 0.02436$

∴ $24.36 \times 10^{-3} = 0.02436$

Q. 3. A. Express the following information in the standard form

Size of the bacteria is 0.0000004 m

Answer : Given, Size of the bacteria is = 0.0000004 m

$$= 0.0000004 \times \frac{10^7}{10^7}$$

$$= 4 \times \frac{1}{10^7}$$

$$= 4 \times 10^{-7}$$

$$\therefore \text{Size of the bacteria is} = 4 \times 10^{-7} \text{m}$$

Q. 3. B. Express the following information in the standard form

The size of red blood cells is 0.000007mm

Answer : Given, The size of red blood cells is = 0.000007mm

$= 0.000007 \times \frac{10^6}{10^6}$

$= 7 \times 10^{-6}$

The size of red blood cells $= 7 \times 10^{-6}$mm

Q. 3. C. Express the following information in the standard form

The speed of light is 300000000 m/sec

Answer : Given, The speed of light is = 300000000 m/sec

$= 300000000 \times \frac{10^8}{10^8}$

$= 3.0 \times 10^8$

$\therefore$ The speed of light $= 3.0 \times 10^8$m/sec.

Q. 3. D. Express the following information in the standard form

The distance between the moon and the earth is 384467000 m (app)

Answer : Given, The distance between the moon and the earth,

$= 384467000 \times \frac{10^8}{10^8}$

$= 3.84467 \times 10^8$

$\therefore$ The distance between the moon and the earth$=3.84467 \times 10^8$ m

Q. 3. E. Express the following information in the standard form

The charge of an electron is 0.0000000000000000016 coulombs

Answer : Given, The charge of an electron = 0.0000000000000000016 coulombs.

$$= 0.0000000000000000016 \times \frac{10^{19}}{10^{19}}$$

$$= 1.6 \times 10^{-19}$$

$$\therefore \text{The charge of an electron} = 1.6 \times 10^{-19} \text{ coulombs.}$$

Q. 3. F. Express the following information in the standard form

Thickness of a piece of paper is 0.0016 cm

Answer : Given, Thickness of a piece of paper = 0.0016 cm

$$= 0.0016 \times \frac{10^{3}}{10^{3}}$$

$$= 1.6 \times \frac{1}{10^{3}}$$

$$= 1.6 \times 10^{-3}$$

$$\therefore \text{Thickness of a piece of paper} = 1.6 \times 10^{-3} \text{cm.}$$

Q. 3. G. Express the following information in the standard form

The diameter of a wire on a computer chip is 0.000005 cm

Answer : Given, diameter of a wire on a computer chip = 0.000005 cm.

$= 0.000005 \times \frac{10^6}{10^6}$

$= 5 \times \frac{1}{10^6}$

$= 5 \times 10^{-6}$

$\therefore$ The diameter of a wire on a computer chip $= 5 \times 10^{-6}$cm.

Q. 4. In a pack, there are 5 books, each of thickness 20 mm and 5 paper sheets each of thickness 0.016mm. What is the total thickness of the pack.

Answer : Given, thickness of book = 20mm

Thickness of paper = 0.016mm

The total thickness of the pack is to be found.

$\Rightarrow$ The total thickness of the pack = (5×20) + (5×0.016)

= 100 + 0.08

= 100.08

$= 1.0008 \times 10^2$mm

$\therefore$ The total thickness of the pack = 1.0008×10^2 mm

Q. 5. A. Rakesh solved some problems of exponents in the following way. Do you agree with the solutions? If not why? Justify your argument.

$x^{-3} \times x^{-2} = x^{-6}$

Answer : Given, $x^{-3} \times x^{-2} = x^{-6}$

$\Rightarrow$ the solution is wrong, because

$\Rightarrow x^{-3} \times x^{-2} = x^{-3-2}$

$= x^{-5}$

$\therefore x^{-3} \times x^{-2} \neq x^{-6}$

Q. 5. B. Rakesh solved some problems of exponents in the following way. Do you agree with the solutions? If not why? Justify your argument.

$$\frac{\left(x^2\right)^3 = 3x^{-1} = \frac{1}{3x}\sqrt{x} = x^8}{x^2} = x^4$$

Answer :

Given, $\frac{\left(x^2\right)^3 = 3x^{-1} = \frac{1}{3x}\sqrt{x} = x^8}{x^2} = x^4$

$\Rightarrow \frac{x^3}{x^2} = x^{3-2}$

$= x$

$\therefore \frac{x^3}{x^2} \neq x^4$

Q. 5. C. Rakesh solved some problems of exponents in the following way. Do you agree with the solutions? If not why? Justify your argument.

$\left(x^2\right)^3 = x^{2^3} = x^8$

Answer :

Given, $\left(x^2\right)^3 = x^{2^3} = x^8$

$\Rightarrow (x^2)^3 = x^{2x3}$

$= x^6$

$\therefore$ the solution by Rakesh is wrong.

Q. 5. D. Rakesh solved some problems of exponents in the following way. Do you agree with the solutions? If not why? Justify your argument.

$x^{-2} = \sqrt{x}$

Answer :

Given, $x^{-2} = \sqrt{x}$

$\Rightarrow x^{-2} = \frac{1}{x^2}$

$\therefore x^{-2} \neq \sqrt{x}$

Q. 5. E. Rakesh solved some problems of exponents in the following way. Do you agree with the solutions? If not why? Justify your argument.

$3x^{-1} = \frac{1}{3x}$

Answer :

Given, $3x^{-1} = \frac{1}{3x}$

$\Rightarrow 3x^{-1} = 3 \times \frac{1}{x}$

$= \frac{3}{x}$

$\therefore 3x^{-1} \neq \frac{1}{3x}$