Powers Ex 2.2 Q12

Answer :

(i) We have:

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

$$\left(\frac{1}{4}\right)^{-12} = \left(\frac{1}{4}\right)^{-4x} \quad (am \times an = am+n)$$

$$-12 = -4x$$

$$3 = x$$

$x = 3$

(ii) We have:

$$\left(\frac{-1}{2}\right)^{-19} \times \left(\frac{-1}{2}\right)^{8} = \left(\frac{-1}{2}\right)^{-2x+1}$$

$$\left(\frac{-1}{2}\right)^{-11} = \left(\frac{-1}{2}\right)^{-2x+1} \quad (am \times an = am+n)$$

$$-11 = -2x + 1$$

$$-12 = -2x$$

$$6 = x$$

$x = 6$

(iii) We have:

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

$$\left(\frac{3}{2}\right)^{2} = \left(\frac{3}{2}\right)^{2x+1}$$

$$2 = 2x + 1$$

$$1 = 2x$$

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

$x = 1/2$

(iv) We have:

$$\left(\frac{2}{5}\right)^{-3} \times \left(\frac{2}{5}\right)^{15} = \left(\frac{2}{5}\right)^{2+3x}$$

$$\left(\frac{2}{5}\right)^{12} = \left(\frac{2}{5}\right)^{2+3x}$$

$$12 = 2 + 3x$$

$$10 = 3x$$

$$\frac{10}{3} = x$$

$x = 10/3$

(v) We have:

$$\left(\frac{5}{4}\right)^{-x} \div \left(\frac{5}{4}\right)^{-4} = \left(\frac{5}{4}\right)^{5}$$

$$\left(\frac{5}{4}\right)^{-x+4} = \left(\frac{5}{4}\right)^{5}$$

$$-x + 4 = 5$$

$$-x = 1$$

$$x = -1$$

$x = -1$

(vi) We have:

$$\left(\frac{8}{3}\right)^{2x+1} \times \left(\frac{8}{3}\right)^{5} = \left(\frac{8}{3}\right)^{x+2}$$

$$\left(\frac{8}{3}\right)^{2x+6} = \left(\frac{8}{3}\right)^{x+2}$$

$$2x + 6 = x + 2$$

$$x = -4$$

$x = -4$

********** END **********