

Powers Ex 2.2 Q12

Answer:

(i) We have:

x = 3

(ii) We have:

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

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

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

$$-12 = -2x$$

$$6 = x$$

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:

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

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

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

$$12 = 2 + 3x$$

$$10 = 3x$$

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

x = 10/3

(v) We have:

$$\left(\frac{5}{4}\right)^{-x} \div \left(\frac{5}{4}\right)^{-4} = \left(\frac{5}{4}\right)^{5}$$
$$\left(\frac{5}{4}\right)^{-x+4} = \left(\frac{5}{4}\right)^{5}$$
$$-x+4=5$$
$$-x=1$$
$$x=-1$$

 $\chi = -1$

(vi) We have:

$$\begin{pmatrix} 8 \\ \overline{3} \end{pmatrix}^{2x+1} \times \begin{pmatrix} 8 \\ \overline{3} \end{pmatrix}^5 = \begin{pmatrix} 8 \\ \overline{3} \end{pmatrix}^{x+2}$$

$$\begin{pmatrix} 8 \\ \overline{3} \end{pmatrix}^{2x+6} = \begin{pmatrix} 8 \\ \overline{3} \end{pmatrix}^{x+2}$$

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

$$x = -4$$

x = -4

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