

Mathematics

TEXTBOOK FOR CLASS VIII

4. Evaluate

$$i) \frac{8^{-1} \times 5^3}{2^{-4}}$$

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

$$= \frac{2^4 \times 5^3}{8}$$

$$\frac{1}{a^m} = a^{-m}$$

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

$$\begin{array}{r} 2 \overline{)8} \\ 2 \overline{)4} \\ 2 \end{array}$$

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

$$\frac{a^m}{a^n} = a^{m-n}$$

$$= 2^1 \times 5^3$$

$$= 2 \times 125$$

$$= \underline{\underline{250}}$$

$$ii) (5^{-1} \times 2^{-1}) \times 6^{-1}$$

$$a^{-m} = \frac{1}{a^m}$$

$$\left[\frac{1}{5} \times \frac{1}{2} \right] \times \frac{1}{6}$$

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

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

$$= \underline{\underline{\frac{1}{60}}}$$

5. Find the value of m for which

$$5^m \div 5^{-3} = 5^5$$

$$5^m \div 5^{-3} = 5^5$$

$$\frac{5^m}{5^{-3}} = 5^5$$

$$5^{m-(-3)} = 5^5$$

$$5^{m+3} = 5^5$$

$$m+3 = 5$$

$$m = 5 - 3$$

$$\underline{\underline{m = 2}}$$

6. Evaluate

$$i) \left\{ \left(\frac{1}{3} \right)^{-1} - \left(\frac{1}{4} \right)^{-1} \right\}^{-1}$$

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

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

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

$$= (-1)^{-1}$$

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

$$= \frac{1}{(-1)} = \underline{\underline{-1}}$$

Teacher's Signature.....

ii)

$$\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-4}$$

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

$$= \left(\frac{8}{5}\right)^7 \times \left(\frac{5}{8}\right)^4$$

$$= \frac{8^7}{5^7} \times \frac{5^4}{8^4}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$= \frac{8^{7-4}}{5^{7-4}}$$

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

$$= \frac{8^3}{5^3}$$

$$= \frac{512}{125}$$

$$8 \times 8 \times 8 = 512$$

$$5 \times 5 \times 5 = 125$$

7. Simplify.

$$i) \frac{25 \times t^{-4}}{5^{-3} \times 10 \times t^{-8}}$$

$$(t \neq 0)$$

$$= \frac{5^2 \times t^{-4}}{5^{-3} \times 5 \times 2 \times t^{-8}}$$

$$\frac{5(25)}{5}$$

$$= \frac{5^2 \times t^{-4}}{5^{-3+1} \times 2 \times t^{-8}}$$

$$= \frac{5^2 \times t^{-4}}{5^{-2} \times 2 \times t^{-8}}$$

$$= 5^{2-(-2)} \times t^{-4-(-8)} \times 2^{-1}$$

$$= 5^{2+2} \times t^{-4+8} \times 2^{-1}$$

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

$$= \frac{625 t^4}{2}$$

$$= \underline{5 \times 5 \times 5 \times 5}$$

$$= 25 \times 25$$

$$= \underline{625}$$

ii)
$$\frac{3^{-5} \times 10^{-5} \times 125}{5^{-7} \times 6^{-5}}$$

$$= \frac{3^{-5} \times (10)^{-5} \times 5^3}{5^{-7} \times (3 \times 2)^{-5}}$$

$$= \frac{3^{-5} \times 5^{-5} \times 2^{-5} \times 5^3}{5^{-7} \times 3^{-5} \times 2^{-5}}$$

$$= 3^{-5-(-5)} \times 5^{-5+3-(-7)} \times 2^{-5-(-5)}$$

$$= 3^{-5+5} \times 5^{-2+7} \times 2^{-5+5}$$

$$= 3^0 \times 5^5 \times 2^0$$

$$= 1 \times 5^5 \times 1 = \underline{5^5}$$

Teacher's Signature

Exercise 2.2

I Express the following numbers in standard form.

$$\text{i) } 0.00000000000085 \\ = 8.5 \times 10^{-12}$$

$$\text{ii) } 0.000000000000942 \\ = 9.42 \times 10^{-12}$$

$$\text{iii) } 6020000000000000 \\ = 6.02 \times 10^{15}$$

$$\text{iv) } 0.000000000837 \\ = 8.37 \times 10^{-9}$$

$$\text{v) } 31860000000 \\ = 3.186 \times 10^{10}$$