

***Welland Gouldsmith School,
Patuli***

Class - VIII

Subject - Mathematics

Topic - Exponents & Power

Work Sheet Answer

$$\begin{aligned} 1] \text{ i) } (2^5 \div 2^8)^5 \times 2^{-5} &= (2^5/2^8)^5 \times 2^{-5} \\ &= (2^{5-8})^5 \times 2^{-5} \\ &= (2^{-3})^5 \times 2^{-5} \\ &= 2^{-15-5} = 2^{-20} \end{aligned}$$

$$\begin{aligned} \text{ii) } (-3)^4 \times (5/3)^4 &= (3)^4 \times 5^4/3^4 \text{ [As } (-)^4 = +\text{ve]} \\ &= 3^4 \times 5^4/3^4 \\ &= 5^4 \end{aligned}$$

$$\begin{aligned} \text{iii) } (3^2)^3 \div (6^3)^2 &= 3^6 \div 6^6 \\ &= 3^6 \div (3 \times 2)^6 \\ &= \frac{3^6}{3^6 \times 2^6} \\ &= 1/2^6 \\ &= 2^{-6} \end{aligned}$$

$$\begin{aligned} \text{iv) } (2^{12} \div 2^7) \times 9^{-5} &= 2^{12}/2^7 \times (3^2)^{-5} \\ &= 2^{12-7} \times 3^{-10} \\ &= 2^5 \times 3^{-10} \end{aligned}$$

$$\begin{aligned} 2] \text{ i) } (-7)^3 \div (-7)^6 \times (-7)^5 &= -7^3/-7^6 \times -7^5 \\ &= (-7)^{3+5-6} \\ &= (-7)^{8-6} \\ &= (-7)^2 \\ &= 49 \end{aligned}$$

$$\begin{aligned}
 \text{ii)} \quad 2^{-4} \times 9^3 \times 4 &= 2^{-4} \times (3^2)^3 \times 2^2 \\
 &= 2^{-4+2} \times 3^6 \\
 &= 2^{-2} \times 3^6 \\
 &= 1/2^2 \times 3^6 \\
 &= 729/4
 \end{aligned}$$

$$\begin{aligned}
 \text{iii)} \quad (3^0 \div 6^0) \times 9^0 &= 3^0/6^0 \times 9^0 \text{ [As } a^0 = 1] \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 \text{iv)} \quad [3^{-1} + 4^{-1} + 5^{-1}]^2 &= [1/3 + 1/4 + 1/5]^2 \\
 &= \left[\frac{20 + 15 + 12}{60} \right]^2 \\
 &= (47/60)^2 \\
 &= \frac{47 \times 47}{60 \times 60} \\
 &= \frac{2209}{3600}
 \end{aligned}$$

$$\begin{aligned}
 \text{v)} \quad \{(1/3)^{-2} - (1/2)^{-3}\} \div (1/4)^{-2} \\
 &= \{(3^{-1})^{-2} - (2^{-1})^{-3}\} \div (1/2^2)^{-2} \\
 &= \{(3^2) - (2^3)\} \div (2^{-2})^{-2} \\
 &= \{9 - 8\} \div 2^4 \\
 &= 1/2^4 \\
 &= 1/16
 \end{aligned}$$

$$\begin{aligned}
 \text{vi)} \quad (5^{-1} \times 2^{-1}) \div 6^{-1} &= (1/5 \times 1/2) \div 1/6 \\
 &= 1/5 \times 1/2 \times 6 \\
 &= 3/5
 \end{aligned}$$

$$\begin{aligned}
 \text{vii)} \quad \frac{3^{-5} \times 10^{-5} \times 125}{5^{-7} \times 6^{-5}} \\
 &= \frac{3^{-5} \times (5 \times 2)^{-5} \times (5)^3}{5^{-7} \times (2 \times 3)^{-5}} \\
 &= \frac{3^{-5} \times 5^{-5} \times 2^{-5} \times 5^3}{5^{-7} \times 2^{-5} \times 3^{-5}} \\
 &= \frac{5^{-5} \times 5^3}{5^{-7}}
 \end{aligned}$$

$$\begin{aligned}
&= 5^{-5+3-(-7)} \\
&= 5^{-5+3+7} \\
&= 5^5 \\
&= 3125
\end{aligned}$$

$$\begin{aligned}
\text{viii)} \quad &(5/9)^{-2} \times (3/5)^{-3} \times (3/5)^0 \\
&= (5/3^2)^{-2} \times (3/5)^{-3} \times 1 \text{ [As } a^0 = 1\text{]} \\
&= 5^{-2}/3^{-4} \times 3^{-3}/5^{-3} \\
&= 5^{-2+3} \times 3^{-3+4} \\
&= 5 \times 3 \\
&= 15
\end{aligned}$$

$$\begin{aligned}
3] \quad &(2/3)^{-2} = (3/2)^4 \times (2/3)^x \\
\rightarrow &(2/3)^{-2} = (2/3)^{-4} \times (2/3)^x \text{ [As } (a/b)^m = (b/a)^{-m}\text{]} \\
\rightarrow &(2/3)^{-2} = (2/3)^{-4+x} \text{ [} a^m = a^n \therefore m = n\text{]} \\
\rightarrow &-2 = -4 + x \\
\rightarrow &-2 + 4 = x \\
\rightarrow &X = 2 \text{ Ans.}
\end{aligned}$$

$$\begin{aligned}
4] \text{ i)} \quad &0.000578 \\
&= \frac{578}{1000000} = \frac{578}{100} \times \frac{1}{10000} = 5.78 \times 10^{-4}
\end{aligned}$$

$$\text{ii)} \quad 450000 = 4.5 \times 10^5$$

$$\begin{aligned}
5. \quad &9^m \div 3^{-2} = 9^4 \\
\rightarrow &9^m / 3^{-2} = 9^4 \\
\rightarrow &(3^2)^m / 3^{-2} = (3^2)^4 \\
\rightarrow &3^{2m - (-2)} = 3^8 \\
\rightarrow &2m + 2 = 8 \\
\rightarrow &2m = 8 - 2 \\
\rightarrow &2m = 6 \\
\rightarrow &m = 3 \text{ Ans.}
\end{aligned}$$

$$\begin{aligned}
6. \quad &3^{-5} \times 3^2 \div 3^{-6} + (2^2 \times 3)^2 + (2/3)^{-1} + 2^{-1} + (1/19)^{-1} \\
&= \frac{3^{-5} \times 3^2}{3^{-6}} + 2^4 \times 3^2 + \frac{3}{2} + \frac{1}{2} + 19 \\
&= 3^{-5+2-(-6)} + 16 \times 9 + 3/2 + 1/2 + 19 \\
&= 3^3 + 144 + 3/2 + 1/2 + 19 \\
&= 27 + 144 + 3/2 + 1/2 + 19 \\
&= 190 + 3/2 + 1/2
\end{aligned}$$

$$= \frac{380 + 3 + 1}{2}$$

$$= \frac{384}{2}$$

$$= 192$$