

1) Evaluate the given expression with positive exponent: $4^3 \times 4^{-9}$

$$= \cancel{4^3 \times 4^{-9}} = 4^3 \times 4^{-9} = 4^{3-9} = 4^{-6}$$

$$= \cancel{3200}$$

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

$$= \frac{(2+12+12)}{12} = \frac{(36)}{12}$$

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

$$\frac{12}{12} \frac{12}{12} \frac{12}{36} 3) (2^{-1} \times 3^{-1})^{-1}$$

$$= 2^{-1}$$

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

$$4) \left(\frac{5}{7}\right)^{65} \div \left(\frac{5}{7}\right)^{32}$$

$$= (35)^{65} \div (35)^{32}$$

$$= 2275 \div 1120$$

$$5) 27^{\frac{2}{3}} \div (27)^{\frac{1}{3}}$$

$$= \underline{\hspace{2cm}}$$

$$6) \begin{array}{r|l} 3 & 675 \\ \hline 3 & 225 \\ \hline 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

7) Evaluate using laws

$$= \left(\frac{1}{5} \div \frac{1}{6} \right) + \frac{1}{3}$$

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

$$= \left(\frac{1}{3} + \frac{1}{4}\right)^{-1} \div 5^{-1}$$

$$= \left(\frac{4+3}{12}\right)^{-1} \div 5^{-1}$$

$$= \left(\frac{7}{12}\right)^{-1} \div 5^{-1}$$

$$= \left(\frac{12}{7}\right) \div \left(\frac{1}{5}\right)$$

$$= \frac{12 \times 5}{7 \times 1} = \frac{12 \times 5}{7 \times 1}$$

$$= \frac{60}{7}$$

$$9) \quad (2+\sqrt{5})^5 = 32 + 80\sqrt{5} + 400 + 200\sqrt{5} + 250 + 25\sqrt{5}$$
$$= 682 + 305\sqrt{5}$$

$$(2-\sqrt{5})^5 = 32 - 80\sqrt{5} + 400 - 200\sqrt{5} + 250 - 25\sqrt{5}$$
$$= 682 - 305\sqrt{5}$$

$$(2+\sqrt{5})^5 + (-2-\sqrt{5})^5$$

$$= 682 + 305\sqrt{5} + 682 - 305\sqrt{5}$$

$$= 1364$$