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Question 1: Write (625)$^{-1/4}$ in decimal form.
Solution:
(625)$^{-1/4}$ = (5^4)$^{-1/4}$ = 5^{-1} = 1/5 = 0.2

Question 2: State the product law of exponents:
Solution:
To multiply two parts having same base, add the exponents.
Mathematically: x^m x x^n = x^{m+n}

Question 3: State the quotient law of exponents.
Solution:
To divide two exponents with the same base, subtract the powers.
Mathematically: x^m ÷ x^n = x^{m-n}

Question 4: State the power law of exponents.
Solution:
Power law of exponents :
(x^m)^n = x$^{m \times n}$ = x^{mn}

Question 5: For any positive real number x, find the value of

$$\left(\frac{x^a}{x^b}\right)^{a+b} \left(\frac{x^b}{x^c}\right)^{b+c} \left(\frac{x^c}{x^a}\right)^{c+a}$$

Solution:

$$\left(\frac{x^a}{x^b}\right)^{a+b} \left(\frac{x^b}{x^c}\right)^{b+c} \left(\frac{x^c}{x^a}\right)^{c+a}$$

$$= (x^{a-b})^{a+b} \times (x^{b-c})^{b+c} \times (x^{c-a})^{c+a}$$

$$= x^{a^2-b^2} \times x^{b^2-c^2} \times x^{c^2-a^2}$$

$$= x^{a^2-b^2+b^2-c^2+c^2-a^2}$$

$$= 1$$

Question 6: Write the value of $\{5(8^{1/3} + 27^{1/3})^3\}^{1/4}$.

Solution:

$\{5(8^{1/3} + 27^{1/3})^3\}^{1/4}$

$= \{5(2^{3 \times 1/3} + 3^{3 \times 1/3})^3\}^{1/4}$

$= \{5(2 + 3)\hat{}3\}^{1/4}$

$= (5^4)^{1/4}$

$= 5$