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SURDS & INDICES

முறுடுகள் & அடுக்குகள்

TNPSC GROUP-IV

TOPIC - 2

HOME WORK



#FeelFreetoLearn

Question: 1

$$(3)^8 \times (3)^4 = ?$$

Solution:

$$(3)^8 \times (3)^4 = ?$$

$$? = 3^{(8+4)} = 3^{12}$$

$$= (3^6)^2 = (729)^2$$

Question: 2

$$\frac{5^3}{5^4} = ?$$

Solution:

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

$$5^{3-4} = 5^{-1} = 1/5$$

Question: 3

$$(58)^5 \times (58)^7 \div (58)^2 = (58)^?$$

Solution:

$$(58)^5 \times (58)^7 \div (58)^2 = (58)^?$$

$$(58)^5 \times (58)^{7-2} = (58)^?$$

$$(58)^{5+5} = (58)^?$$

$$? = 10$$

Question: 4

$$\frac{9^2 \times 18^4}{3^{16}} = ?$$

Solution:

$$\frac{9^2 \times 18^4}{3^{16}} = ?$$

$$\frac{(3^2)^2 \times (2 \times 9)^4}{3^{16}} = \frac{3^4 \times (3^2)^4 \times 2^4}{3^{16}} = \frac{3^4 \times (3)^8 \times 2^4}{3^{16}}$$

$$= \frac{3^{12} \times 2^4}{3^{16}} = \frac{2^4}{3^4} = \frac{16}{81}$$

Question: 5

$$(10)^{24} \times (10)^{-21} = ?$$

Solution:

$$(10)^{24} \times (10)^{-21} = ?$$

$$? = 10^{(24-21)} = 10^3 = 1000$$

Question: 6

$$(429)^{21} \times (429)^? = 429^{53}$$

Solution:

$$(429)^{21} \times (429)^? = 429^{53}$$

$$= 429^{(21+x)} = 429^{53}$$

$$= 21 + x = 53$$

$$X = (53 - 21)$$

$$X = 32$$

Question: 7

$$(2)^3 \times (2)^5 = ?$$

Solution:

$$a^m \times a^n = a^{m+n}$$

$$2^{3+5} = 2^8 = 256$$

Question: 8

$$(10)^{7.3} \div (100)^{4.15} \times (1000)^2 + 10^5 = ? \times 10^5$$

Solution:

$$(10)^{7.3} \div (100)^{4.15} \times (1000)^2 + 10^5 = ? \times 10^5$$

$$(10)^{7.3} \div (10^2)^{4.15} \times (10^3)^2 + 10^5 = ? \times 10^5$$

$$(10)^{7.3} \div (10)^{8.3} \times (10)^6 + 10^5 = ? \times 10^5$$

$$(10)^{-1} \times (10)^6 + 10^5 = ? \times 10^5$$

$$(10)^5 + 10^5 = ? \times 10^5$$

$$2 \times (10)^5 = ? \times 10^5$$

$$\therefore ? = 2$$

Question: 9

$$\frac{9^n \times 3^5 \times 27^3}{3 \times 81^4} = 27$$

Solution:

$$\frac{9^n \times 3^5 \times 27^3}{3 \times 81^4} = 27$$

$$9^n \times 3^5 \times 27^3 = 27 \times 3 \times 81^4$$

$$3^{2n} \times 3^5 \times 3^9 = 3^3 \times 3 \times 3^{16}$$

$$3^{2n+5+9} = 3^{3+1+16}$$

$$3^{2n+14} = 3^{20}$$

$$2n = 20 - 14 = 6$$

$$n = 6/2 = 3$$

Question: 10

$$\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}, \text{ Find } x?$$

Solution:

$$\left(\frac{a}{b}\right)^{x-1} = \left(\frac{b}{a}\right)^{x-3}$$

$$x - 1 = -x + 3$$

$$x + x = 3 + 1$$

$$2x = 4$$

$$x = 2$$

Question: 11

$$\frac{(17^{14} \times 17^{16})}{17^8} = ?$$

Solution:

$$\frac{(17^{14} \times 17^{16})}{17^8} = ?$$

$$= 17^{14+16-8} = 17^{22}$$

Question: 12

$$\left(\frac{9^{-7}}{27^{-3}}\right)^{\frac{4}{5}} = ?$$

Solution:

$$\left(\frac{9^{-7}}{27^{-3}}\right)^{\frac{4}{5}} = ?$$

$$? = \left(\frac{(3^3)^{-7}}{(3^3)^{-3}}\right)^{\frac{4}{5}}$$

$$? = \left(\frac{3^{-14}}{3^9}\right)^{\frac{4}{5}} = 3^{-4}$$

Question: 13

$$\left(27^{\frac{2}{3}} \times 9^{\frac{1}{2}} \times 81^{\frac{1}{4}}\right)^{-\frac{1}{4}} = ?$$

Solution:

$$\left(27^{\frac{2}{3}} \times 9^{\frac{1}{2}} \times 81^{\frac{1}{4}}\right)^{-\frac{1}{4}} = ?$$

$$? = \left[(3^3)^{\frac{2}{3}} \times (3^2)^{\frac{1}{2}} \times (3^4)^{\frac{1}{4}}\right]^{-\frac{1}{4}}$$

$$? = (3^2 \times 3 \times 3)^{-\frac{1}{4}} = (3^4)^{-\frac{1}{4}} = \frac{1}{3}$$

Question: 14

$$\frac{3^5}{81} \times 3^8 \times \frac{9}{27} = 3^? \times 243$$

Solution:

$$\frac{3^5}{81} \times 3^8 \times \frac{9}{27} = 3^? \times 243$$

$$= 3^{(5-4+8+2-3)} = 3^{(x+5)}$$

$$= 8 = x + 5$$

$$x = 3$$

Question: 15

$$27^{1.5} \times [(3)^3]^? = 27^5$$

Solution:

$$27^{1.5} \times [(3)^3]^? = 27^5$$

$$27^{1.5} \times 27^? = 27^5$$

$$27^{?+1.5} = 27^5$$

$$? = 5 - 1.5 = 3.5$$

Question: 16

$$(256)^2 \times 64 \div 16^5 \times 4096 = 4^? \times 256$$

Solution:

$$(256)^2 \times 64 \div 16^5 \times 4096 = 4^? \times 256$$

$$\Rightarrow 4^8 \times 4^3 \div 4^{10} \times 4^6 = 4^? \times 4^4$$

$$\Rightarrow (8+3-10+6) = (? + 4)$$

$$7 = ? + 4$$

$$? = 3$$

Question: 17

$$(0.16)^2 \div (0.064) \times (0.4)^8 = (0.4)^?$$

Solution:

$$(0.16)^2 \div (0.064) \times (0.4)^8 = (0.4)^?$$

$$(0.4)^4 \div (0.4)^3 \times (0.4)^8 = (0.4)^?$$

$$(0.4)^{(4-3+8)} = (0.4)^?$$

$$x = 9$$

Question: 18

$$(27)^2 \times \left(\frac{9}{81}\right) = 3^? \times 3$$

Solution:

$$(27)^2 \times \left(\frac{9}{81}\right) = 3^? \times 3$$

$$\Rightarrow (3)^6 \times \left(\frac{3^2}{3^4}\right) = 3^{(?+1)}$$

$$\Rightarrow 6 + 2 - 4 = ? + 1$$

$$\Rightarrow 4 = ? + 1$$

$$? = 3$$

Question: 19

$$[(7)^{2.7} \times (343)^{1.5}]^{\frac{1}{3}} = ?$$

Solution:

$$[(7)^{2.7} \times (343)^{1.5}]^{\frac{1}{3}} = ?$$

$$? = (7)^{2.7 \times \left(\frac{1}{3}\right)} \times (7)^{3 \times 1.5 \times \left(\frac{1}{3}\right)}$$

$$? = 7^{0.9} \times 7^{1.5} = 7^{2.4}$$

Question: 20

$$(0.0256) \div 0.064 \times (0.4)^8 = (0.4)^? \times 0.16$$

Solution:

$$(0.0256) \div 0.064 \times (0.4)^8 = (0.4)^? \times 0.16$$

$$\Rightarrow (0.4)^4 \div (0.4)^3 \times (0.4)^8 = (0.4)^? \times (0.4)^2$$

$$\Rightarrow (0.4)^{(4-3+8)} = (0.4)^{(?+2)}$$

$$\Rightarrow 4 - 3 + 8 = ? + 2$$

$$? = 9 - 2 = 7$$