Question

13. Let $\log_b A = 3; \log_b C = 2; \log_b D = 5$

What is the value of $\log_b \dfrac{D^2}{C^3 \times A}$

A: 19

B: 1

C: 0.549

D: 4.44

Solution

$$\log_b \frac{D^2}{C^3 \times A} =$$
$$= \log_b D^2 - \log_b(C^3 \times A)$$
$$= \log_b D^2 - (\log_b C^3 + \log_b A)$$
$$= \log_b D^2 - \log_b C^3 - \log_b A$$
$$= 2 \times \log_b D - 3 \times \log_b C - \log_b A$$

If $\log_b A = 3; \log_b C = 2; \log_b D = 5$, then

$$\log_b \frac{D^2}{C^3 \times A} = 2 \times \log_b D - 3 \times \log_b C - \log_b A = 2 \times 5 - 3 \times 2 - 3 =$$
$$= 10 - 6 - 3 = 1$$

Answer:

B: 1

Question

14. Let $\log \dfrac{P}{N} = 6$ and $\log \dfrac{M}{N} = 8$. What is the relationship between P and M?

A: P = 100M

B: M = 100P

C: M = .001P

D: M = 2P

Solution

$$\log \frac{P}{N} = 6 \Rightarrow \log P - \log N = 6$$

$$\log \frac{M}{N} = 8 \Rightarrow \log M - \log N = 8$$

Let's find the difference between these equalities:

$$\log M - \log N = 8$$

$$\log P - \log N = 6$$

$$(\log M - \log N) - (\log P - \log N) = 8 - 6$$

Open brackets

$$\log M - \log N - \log P + \log N = 2$$

Cancel terms

$$\log M - \log P = 2$$

Using properties of logarithm

$$\log \frac{M}{P} = 2$$

Assuming that the "log" is the decimal (common) logarithm

$$\frac{M}{P} = 10^2$$

$$M = 100 \, P$$

Answer:

B: M = 100P

Question

15. Solve the equation below for x: log(2x) + log(x − 1) = log(6x)

A: There are no solutions.
B: x = -1/3
C: x = 4
D: x = 0, 4

Solution

$$\log(2x) + \log(x-1) = \log(6x)$$

$$\log 2 + \log x + \log(x-1) = \log 6 + \log x$$

$$\log 2 + \log x + \log(x-1) = \log 3 + \log 2 + \log x$$

$$\log(x-1) = \log 3$$

$$x - 1 = 3$$

$$x = 4$$

Answer:

C: x = 4

C: x = 4