

We know that the result of a repeated addition can be held by multiplication e.g.

$$4 + 4 + 4 + 4 + 4 = 5(4) = 20$$

 $a + a + a + a + a = 5(a) = 5a$

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INDICES	Summary	Exercise	LOGARITHM	Fundamental Laws of Logarithm	Summary	Exercise
Indic	ces					
No	W,			-		

$$4 \times 4 \times 4 \times 4 \times 4 = 4^{\circ},$$
$$a \times a \times a \times a \times a = a^{5}.$$

It may be noticed that in the first case 4 is multiplied 5 times and in the second case'a' is multiplied 5 times.

INDICES		LOGARITHM	Fundamental Laws of Logarithm	
India	ces			
No	W,			

$$4 \times 4 \times 4 \times 4 \times 4 = 4^5,$$

$$a \times a \times a \times a \times a = a^5.$$

It may be noticed that in the first case 4 is multiplied 5 times and in the second case'a' is multiplied 5 times. In all such cases a factor which multiplies is called the "base" and the number of times it is multiplied is called the "power" or the "index". Therefore, "4" and "a" are the bases and "5" is the index for both.

INDICES		LOGARITHM	Fundamental Laws of Logarithm	
Indi	ces			
No	W.			

$$4 \times 4 \times 4 \times 4 \times 4 = 4^5,$$

$$a \times a \times a \times a \times a = a^5.$$

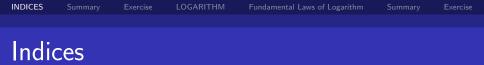
It may be noticed that in the first case 4 is multiplied 5 times and in the second case'a' is multiplied 5 times. In all such cases a factor which multiplies is called the "base" and the number of times it is multiplied is called the "power" or the "index". Therefore, "4" and "a" are the bases and "5" is the index for both. Any base raised to the power zero is defied to be 1; i.e. $a^{\circ} = 1$. We also define $\sqrt[r]{a} = a^{1}/r$

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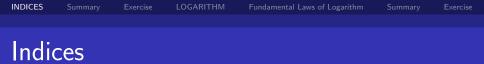
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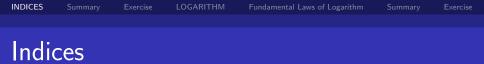


 $a^n = a \times a \times a \dots$, to *n* factors.



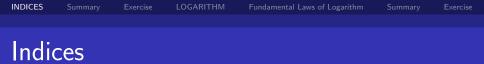
$$a^n = a \times a \times a \dots$$
, to *n* factors.

Here a^n is a power of a whose base is a and the index or power is $n^{"}$



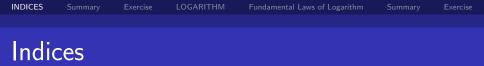
$$a^n = a \times a \times a \dots$$
, to *n* factors.

Here a^n is a power of a whose base is a and the index or power is n" For example, in $3 \times 3 \times 3 \times 3 = 3^4$, 3 is base and 4 is index or power.



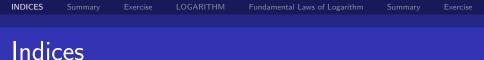
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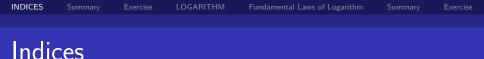


Law 1: $a^m \times a^n = a^{m+n}$, when *m* and *n* are positive integers;

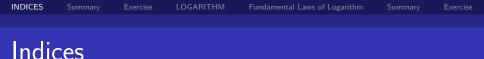
Law 2: $a^m/a^n = a^{m-n}$, when *m* and *n* are positive integers and m > n.



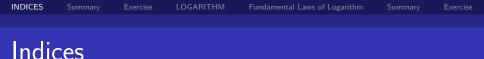
- Law 1: $a^m \times a^n = a^{m+n}$, when *m* and *n* are positive integers;
- Law 2: $a^m/a^n = a^{m-n}$, when *m* and *n* are positive integers and m > n.
- Law 3: $(a^m)^n = a^{mn}$. where *m* and *n* are positive integers



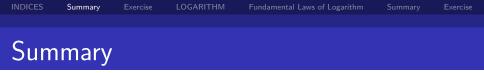
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- Law 3: $(a^m)^n = a^{mn}$. where *m* and *n* are positive integers
- Law 4: $(ab)^n = a^n \cdot b^n$ when *n* can take all of the values.



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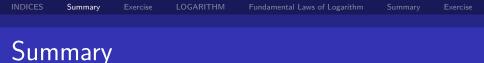


- Law 1: $a^m \times a^n = a^{m+n}$, when *m* and *n* are positive integers;
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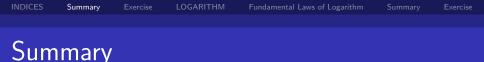
$a^m \times a^n = a^{m+n}$ (base must be same)
 Ex. $2^3 \times 2^2 = 2^{3+2} = 2^5$

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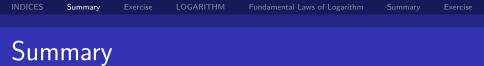
a^m × *aⁿ* = *a^{m+n}* (base must be same) Ex. 2³ × 2² = 2³⁺² = 2⁵ *a^m* × *aⁿ* = *a^{m-n}*

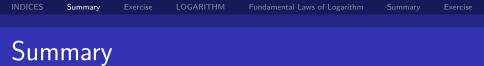
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a^m × *aⁿ* = *a^{m+n}* (base must be same) Ex. 2³ × 2² = 2³⁺² = 2⁵ *a^m* × *aⁿ* = *a^{m-n}* Ex. 2⁵ × 2³ = 2⁵⁻³ = 2²

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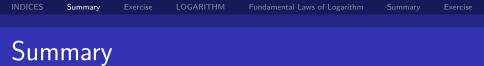
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If
$$a^x = a^y$$
, then $x = y$
If $x^a = y^a$, then $x = y$

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If
$$a^x = a^y$$
, then $x = y$
If $x^a = y^a$, then $x = y$
 $\sqrt[m]{a} = a^{1/m}, \sqrt{X} = x^{1/2}, \sqrt{4} = (2^2)^{1/2} = 2^{1/2 \times 2} = 2$

If
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Ex. $\sqrt[n]{8} = 8^{1/3} = (2^3)^{1/3} = 2^{3 \times 1/3} = 2^$

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If
$$a^x = a^y$$
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Ex. $\sqrt[3]{8} = 8^{1/3} = (2^3)^{1/3} = 2^{3 \times 1/3} = 2^$



 $4x^{-1/4}$ is expressed as

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$$4x^{-1/4}$$
 is expressed as

Options

(a)
$$-4x^{1/4}$$
 (b) x^{-1} (c) $4/x^{1/4}$ (d) none of these

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$$4x^{-1/4}$$
 is expressed as

Options

(a)
$$-4x^{1/4}$$
 (b) x^{-1} (c) $4/x^{1/4}$ (d) none of these

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The value of $8^{1/3}$ is

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INDICES S	Exercise	LOGARITHM	Fundamental Laws of Logarithm	

The value of $8^{1/3}$ is

Options

(a) $3\sqrt{2}$ (b) 4 (c) 2 (d) none of these

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Options

(a) $3\sqrt{2}$ (b) 4 (c) 2 (d) none of these

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The value of $2\times(32)^{1/5}$ is

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The value of $2 \times (32)^{1/5}$ is

Options (a) 2 (b) 10 (c) 4 (d) none of these

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The value of $2 \times (32)^{1/5}$ is

Options (a) 2 (b) 10 (c) 4 (d) none of these

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The value of $4/(32)^{1/5}$ is



The value of $4/(32)^{1/5}$ is

Options (a) 8 (b) 2 (c) 4 (d) none of these

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The value of $4/(32)^{1/5}$ is

Options (a) 8 (b) 2 (c) 4 (d) none of these

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The value of $(8/27)^{1/3}$ is



The value of $(8/27)^{1/3}$ is

Options (a) 2/3 (b) 3/2 (c) 2/9 (d) none of these

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The value of $(8/27)^{1/3}$ is

Options (a) 2/3 (b) 3/2 (c) 2/9 (d) none of these

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The value of $2(256)^{-1/8}$ is



The value of $2(256)^{-1/8}$ is

Options (a) 1 (b) 2 (c) 1/2 (d) none of these

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The value of $2(256)^{-1/8}$ is

Options (a) 1 (b) 2 (c) 1/2 (d) none of these

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$2^{1/2}.4^{3/4}$ is equal to



 $2^{1/2}.4^{3/4}$ is equal to

Options

(a) a fraction (b) a positive integer (c) a negative integer (d) none of these

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 $2^{1/2}.4^{3/4}$ is equal to

Options

(a) a fraction (b) a positive integer (c) a negative integer (d) none of these

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$$\left(\frac{81x^4}{y^{-8}}\right)^{\frac{1}{4}}$$
 has simplified value equal to



$$(\frac{81x^4}{y^{-8}})^{\frac{1}{4}}$$
 has simplified value equal to

Options

(a) xy^2 (b) x^2y (c) $9xy^2$ (d) none of these

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$$\left(\frac{81x^4}{y^{-8}}\right)^{\frac{1}{4}}$$
 has simplified value equal to

Options (a) xy^2 (b) x^2y (c) $9xy^2$ (d) none of these

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$$x^{a-b} \times x^{b-c} \times x^{c-a}$$
 is equal to



$$x^{a-b} \times x^{b-c} \times x^{c-a}$$
 is equal to

Options (a) x (b) 1 (c) 0 (d) none of these

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$$x^{a-b} \times x^{b-c} \times x^{c-a}$$
 is equal to

Options(a) x(b) 1(c) 0(d) none of these

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Question
The value of
$$(\frac{2p^2q^3}{3xy})^0$$
 where $p, q, x, y \neq 0$ is equal to

INDICES	Exercise	LOGARITHM	Fundamental Laws of Logarithm	

Question The value of $(\frac{2p^2q^3}{3xy})^0$ where $p, q, x, y \neq 0$ is equal to

(a) 0 (b) 2/3 (c) 1 (d) none of these

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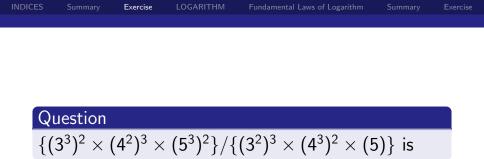
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The value of
$$(\frac{2p^2q^3}{3xy})^0$$
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Options (a) 0 (b) 2/3 (c) 1 (d) none of these

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$$\{(3^3)^2\times (4^2)^3\times (5^3)^2\}/\{(3^2)^3\times (4^3)^2\times (5)\}$$
 is

Options (a) 3/4 (b) 4/5 (c) 4/7 (d) 1

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Question $\{(3^3)^2 \times (4^2)^3 \times (5^3)^2\} / \{(3^2)^3 \times (4^3)^2 \times (5)\} \text{ is }$

Options

(a)
$$3/4$$
 (b) $4/5$ (c) $4/7$ (d) 1

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Which is True ?



Which is True ?

Options

(a) $2^0 > (1/2)^0$ (b) $2^0 < (1/2)^0$ (c) $2^0 = (1/2)^0$ (d) none of these

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Question Which is True ?

Options

(a)
$$2^0 > (1/2)^0$$
 (b) $2^0 < (1/2)^0$ (c) $2^0 = (1/2)^0$ (d) none of these

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If $x^{1/p} = y^{1/q} = z^{1/r}$ and xyz = 1, then the value of p + q + r is



If $x^{1/p} = y^{1/q} = z^{1/r}$ and xyz = 1, then the value of p + q + r is

Options

(a) 1 (b) 0 (c) 1/2 (d) none of these

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Question If $x^{1/p} = y^{1/q} = z^{1/r}$ and xyz = 1, then the value of p + q + r is

Options

(a) 1 (b) 0 (c) 1/2 (d) none of these

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The value of
$$y^{a-b} \times y^{b-c} \times y^{c-a} \times y^{-a-b}$$
 is



The value of
$$y^{a-b} \times y^{b-c} \times y^{c-a} \times y^{-a-b}$$
 is

Options

(a)
$$y^{a+b}$$
 (b) y (c) 1 (d) $1/y^{a+b}$

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The value of
$$y^{a-b} \times y^{b-c} \times y^{c-a} \times y^{-a-b}$$
 is

Options

(a)
$$y^{a+b}$$
 (b) y (c) 1 (d) $1/y^{a+b}$

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The True option is



The True option is

Options

(a)
$$x^{2/3} = \sqrt[3]{x^2}$$
 (b) $x^{2/3} = \sqrt{x^3}$ (c) $x^{2/3} > 3\sqrt{x^2}$ (d) $x^{2/3} < 3\sqrt{x^2}$

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The True option is

Options

(a)
$$x^{2/3} = \sqrt[3]{x^2}$$
 (b) $x^{2/3} = \sqrt{x^3}$ (c) $x^{2/3} > 3\sqrt{x^2}$ (d) $x^{2/3} < 3\sqrt{x^2}$

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The simplified value of $16x^{-3}y^2 \times 8^{-1}x^3y^{-2}$ is



The simplified value of
$$16x^{-3}y^2 \times 8^{-1}x^3y^{-2}$$
 is

Options (a) 2xy (b) xy/2 (c) 2 (d) none of these

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The simplified value of
$$16x^{-3}y^2 \times 8^{-1}x^3y^{-2}$$
 is

Options

(a) 2xy (b) xy/2 (c) 2 (d) none of these

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The value of $(8/27)^{-1/3} \times (32/243)^{-1/5}$ is



The value of
$$(8/27)^{-1/3} imes (32/243)^{-1/5}$$
 is

Options

(a) 9/4 (b) 4/9 (c) 2/3 (d) none of these

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The value of
$$(8/27)^{-1/3} imes (32/243)^{-1/5}$$
 is

Options (a) 9/4 (b) 4/9 (c) 2/3 (d) none of these

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The value of
$$\{(x+y)^{2/3}(x-y)^{3/2}/\sqrt{x+y} \times \sqrt{(x-y)^3}\}^6$$
 is



The value of
$$\{(x+y)^{2/3}(x-y)^{3/2}/\sqrt{x+y} imes \sqrt{(x-y)^3}\}^6$$
 is

Options

(a) $(x + y)^2$ (b) (x-y) (c) x + y (d) none of these

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The value of
$$\{(x+y)^{2/3}(x-y)^{3/2}/\sqrt{x+y} imes \sqrt{(x-y)^3}\}^6$$
 is

Options

(a) $(x + y)^2$ (b) (x-y) (c) x + y (d) none of these

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Simplified value of $(125)^{2/3} \times \surd{25} \times 3\surd{5^3} \times 5^{1/2}$ is



Simplified value of $(125)^{2/3} \times \sqrt{25} \times 3\sqrt{5^3} \times 5^{1/2}$ is

Options (a) 5 (b) 1/5 (c) 1 (d) none of these

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Simplified value of $(125)^{2/3} \times \sqrt{25} \times 3\sqrt{5^3} \times 5^{1/2}$ is

Options (a) 5 (b) 1/5 (c) 1 (d) none of these

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Question
$$[\{(2)^{1/2} \cdot (4)^{3/4} \cdot (8)^{5/6} \cdot (16)^{7/8} \cdot (32)^{9/10}\}^4]^{3/25} \text{ is }$$



Question $[\{(2)^{1/2} \cdot (4)^{3/4} \cdot (8)^{5/6} \cdot (16)^{7/8} \cdot (32)^{9/10}\}^4]^{3/25} \text{ is }$

Options

(a) A fraction (b) an integer (c) 1 (d) none of these

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Question
$$[\{(2)^{1/2} \cdot (4)^{3/4} \cdot (8)^{5/6} \cdot (16)^{7/8} \cdot (32)^{9/10}\}^4]^{3/25} \text{ is }$$

Options

(a) A fraction (b) an integer (c) 1 (d) none of these

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$$[1 - {1 - (1 - x^2)^{-1}}^{-1}]^{-1/2}$$
 is equal to



$$[1 - \{1 - (1 - x^2)^{-1}\}^{-1}]^{-1/2}$$
 is equal to

Options (a) x (b) 1/x (c) 1 (d) none of these

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$$[1 - \{1 - (1 - x^2)^{-1}\}^{-1}]^{-1/2}$$
 is equal to

Options (a) x (b) 1/x (c) 1 (d) none of these

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 $[(x^n)^{n-\frac{1}{n}}]^{\frac{1}{n+1}}$ is equal to

INDICES	Exercise	LOGARITHM	Fundamental Laws of Logarithm	

$$[(x^n)^{n-\frac{1}{n}}]^{\frac{1}{n+1}}$$
 is equal to

Options (a) x^n (b) x^{n+1} (c) x^{n-1} (d) none of these

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INDICES	Exercise	LOGARITHM	Fundamental Laws of Logarithm	

$$[(x^n)^{n-\frac{1}{n}}]^{\frac{1}{n+1}}$$
 is equal to

Options (a) x^n (b) x^{n+1} (c) x^{n-1} (d) none of these

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If
$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$
, then the simplified form of

$$\left[\frac{x^1}{x^m}\right]^{1^2+1m+m^2} \times \left[\frac{x^m}{x^n}\right]^{m^2+r+n^2} \times \left[\frac{x^n}{x^1}\right]^{1^2+\ln+n^2}$$

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If
$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$
, then the simplified form of

$$\left[\frac{x^1}{x^m}\right]^{1^2+1m+m^2} \times \left[\frac{x^m}{x^n}\right]^{m^2+r+n^2} \times \left[\frac{x^n}{x^1}\right]^{1^2+\ln+n^2}$$

Options(a) 0(b) 1(c) x(d) none of these

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If
$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$
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$$\left[\frac{x^1}{x^m}\right]^{1^2+1m+m^2} \times \left[\frac{x^m}{x^n}\right]^{m^2+r+n^2} \times \left[\frac{x^n}{x^1}\right]^{1^2+\ln+n^2}$$

Options (a) 0 (b) 1 (c) x (d) none of these

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Using
$$(a - b)^3 = a^3 - b^3 - 3ab(ab)$$
 tick the correct of these when $x = p^{1/3} - p^{-1/3}$



Using
$$(a - b)^3 = a^3 - b^3 - 3ab(ab)$$
 tick the correct of these when $x = p^{1/3} - p^{-1/3}$

Options

(a)
$$x^3 + 3x = p + 1/p$$
 (b) $x^3 + 3x = p - 1/p$
(c) $x^3 + 3x = p + 1$ (d) none of these

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Using
$$(a - b)^3 = a^3 - b^3 - 3ab(ab)$$
 tick the correct of these when $x = p^{1/3} - p^{-1/3}$

Options

(a)
$$x^3 + 3x = p + 1/p$$
 (b) $x^3 + 3x = p - 1/p$
(c) $x^3 + 3x = p + 1$ (d) none of these

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On simplification, $1/(1 + a^{m-n} + a^{m-p}) + 1/(1 + a^{n-m} + a^{n-p}) + 1/(1 + a^{p-m} + a^{p-n})$ is equal to



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Options

(a) 0 (b) a (c) 1 (d) 1/a

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The value of
$$(\frac{X^a}{X^b})^{a+b} imes (\frac{X^b}{X^c})^{b+c} imes (\frac{X^c}{X^a})^{c+a}$$



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Options (a) 1 (b) 0 (c) 2 (d) none of these

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Question The value of $(\frac{X^a}{X^b})^{a+b} \times (\frac{X^b}{X^c})^{b+c} \times (\frac{X^c}{X^a})^{c+a}$ Options

(a) 1 (b) 0 (c) 2 (d) none of these

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Question If $x = 3^{\frac{1}{3}} + 3^{-\frac{1}{3}}$, then $3x^3 - 9x$ is



If
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, then $3x^3 - 9x$ is

Options (a) 15 (b) 10 (c) 12 (d) none of these

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Options (a) 15 (b) 10 (c) 12 (d) none of these

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If
$$a^x = b$$
, $b^y = c$, $c^z = a$, then xyz is

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If
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The value of
$$(\frac{\chi^a}{\chi^b})^{(a^2+ab+b^2)} \times (\frac{\chi^b}{x^c})^{(b^2+bc+c^2)} \times (\frac{\chi^c}{\chi^a})^{(c^2+ca+a^2)}$$

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The value of
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Options

(a) 1 (b) 0 (c) -1 (d) none of these

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Options

(a) 1 (b) 0 (c) -1 (d) none of these

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If
$$2^{X} = 3^{y} = 6^{-z}, \frac{1}{X} + \frac{1}{y} + \frac{1}{z}$$
 is

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The logarithm of a number to a given base is the index or the power to which the base must be raised to produce the number, i.e. to make it equal to the given number. If there are three quantities indicated by say a, x and n, they are related as follows:



The logarithm of a number to a given base is the index or the power to which the base must be raised to produce the number, i.e. to make it equal to the given number. If there are three quantities indicated by say a, x and n, they are related as follows: If $a^{X} = n$, where n > 0, a > 0 and $a \neq 1$ then x is said to be the logarithm of the number n to the base 'a' symbolically it can be expressed as follows: The logarithm of a number to a given base is the index or the power to which the base must be raised to produce the number, i.e. to make it equal to the given number. If there are three quantities indicated by say a, x and n, they are related as follows: If $a^{X} = n$, where n > 0, a > 0 and $a \neq 1$ then x is said to be the logarithm of the number *n* to the base 'a' symbolically it can be expressed as follows: $\log n = x$ i.e. the logarithm of n to the base 'a' is x. The logarithm of a number to a given base is the index or the power to which the base must be raised to produce the number, i.e. to make it equal to the given number. If there are three quantities indicated by say a, x and n, they are related as follows: If $a^{X} = n$, where n > 0, a > 0 and $a \neq 1$ then x is said to be the logarithm of the number *n* to the base 'a' symbolically it can be expressed as follows: $\log n = x$ i.e. the logarithm of n to the base 'a' is x.

INDICES Summary Exercise LOGARITHM Fundamental Laws of Logarithm Summary Exercise Logarithm

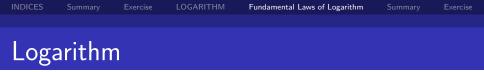
- The two equations a^X = n and x = log_a n are only transformations of each other and should be remembered to change one form of the relation into the other.
- The logarithm of 1 to any base is zero. This is because any number raised to the power zero is one. Since a⁰ = 1, log 1 = 0

INDICES Summary Exercise LOGARITHM Fundamental Laws of Logarithm Summary Exercise Logarithm

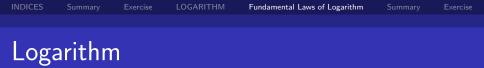
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- The logarithm of any quantity to the same base is unity. This is because any quantity raised to the power 1 is that quantity only. Since a¹ = a, log a = 1

INDICES Summary Exercise LOGARITHM Fundamental Laws of Logarithm Summary Exercise LOGARITHM Fundamental Laws of Logarithm Logarithm

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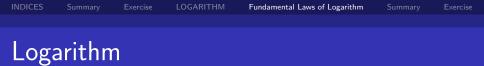


 $\log_a mn = \log_a m + \log_a n$



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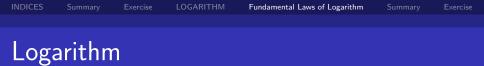
Law 2: The logarithm of the quotient of two numbers is equal to the difference of their logarithms to the same base,



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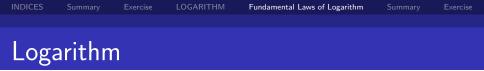
$$\log_a \frac{m}{n} = \log_a m - \log_a n$$



$$\log_a mn = \log_a m + \log_a n$$

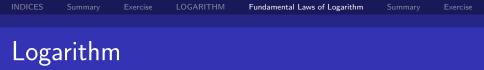
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Law 3: Logarithm of the number raised to the power is equal to the index of the power multiplied by the logarithm of the number to the same base i.e.

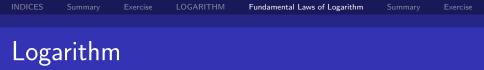
 $\log_a m^n = n \log_a m$



Law 3: Logarithm of the number raised to the power is equal to the index of the power multiplied by the logarithm of the number to the same base i.e.

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Law 4: Change of Base. If the logarithm of a number to any base is given, then the logarithm of the same number to any other base can be determined from the following relation.

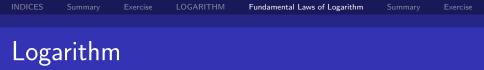


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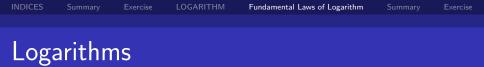
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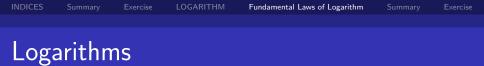
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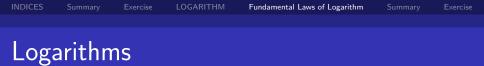


Let $x = \log_a m$ and $y = \log_y n$ $\therefore a^x = m$ and $a^y = n$

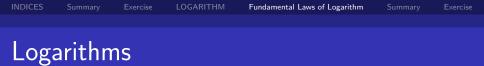
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Let
$$x = \log_a m$$
 and $y = \log_y n$
 $\therefore a^x = m$ and $a^y = n$
So $a^x a^y = mn$



Let
$$x = \log_a m$$
 and $y = \log_y n$
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So $a^x a^y = mn$
or $a^{x+y} = mn$



Let
$$x = \log_a m$$
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or $x + y = \log_a mn$

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So $a^x a^y = mn$
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or $x + y = \log_a mn$
or $\log_a mn = \log_a m + \log_a n$

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Also, $(m/n) = a^x/a^y$

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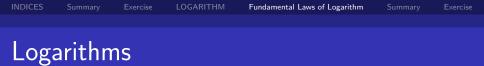
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or $\log_a(m/n) = (x - y)$
or $\log_a(m/n) = \log_a m - \log n$ $[\log_a a = 1]$

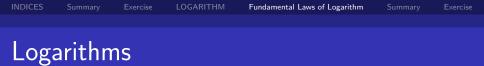
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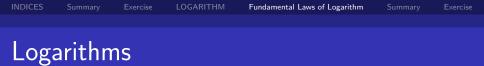
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Let
$$\log_b a = x$$
 and $\log_a b = y$
 $a = b^{\chi}$ and $b = a^{\chi}$



Let
$$\log_b a = x$$
 and $\log_a b = y$
 $a = b^X$ and $b = a^y$
so $a = (a^y)^x$



Let
$$\log_b a = x$$
 and $\log_a b = y$
 $a = b^X$ and $b = a^y$
so $a = (a^y)^x$
or $a^{xy} = a$



Let
$$\log_b a = x$$
 and $\log_a b = y$
 $a = b^X$ and $b = a^y$
so $a = (a^y)^x$
or $a^{xy} = a$
or $xy = 1$

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Let
$$\log_b a = x$$
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or $a^{xy} = a$
or $xy = 1$
or $\log_b a \times \log_a b = 1$

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Let
$$\log_b a = x$$
 and $\log_a b = y$
 $a = b^X$ and $b = a^y$
so $a = (a^y)^x$
or $a^{xy} = a$
or $xy = 1$
or $\log_b a \times \log_a b = 1$
Let $\log_b c = x \& \log_c b = y$

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Let
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 $a = b^X$ and $b = a^y$
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or $xy = 1$
or $\log_b a \times \log_a b = 1$
Let $\log_b c = x \& \log_c b = y$
 $c = b^x \& b = c^y$

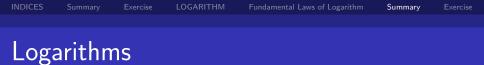
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 $a = b^X$ and $b = a^y$
so $a = (a^y)^x$
or $a^{xy} = a$
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Let $\log_b c = x \& \log_c b = y$
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so $c = c^{xy}$ or $xy = 1$

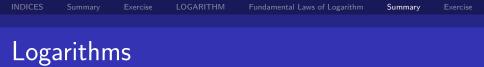
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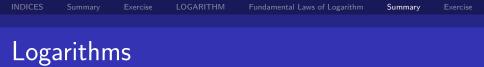
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Let $\log_b c = x \& \log_c b = y$
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so $c = c^{xy}$ or $xy = 1$
 $\log_b c \times \log_c b = 1$



★ $\log_a mn = \log_a m + \log_a n$ ★ $\log_a(m/n) = \log_a m - \log_a n$



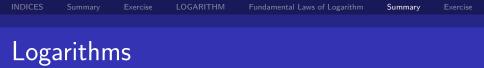


$$\begin{array}{l} \bigstar \ \log_a mn = \log_a m + \log_a n \\ \bigstar \ \log_a (m/n) = \log_a m - \log_a n \\ \bigstar \ \log_a m^n = n \log_a m \\ \bigstar \ \log_a a = 1, a = 1 \\ \bigstar \ \log_1 = 0 \end{array}$$

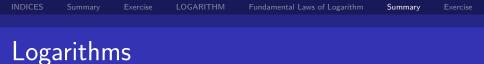
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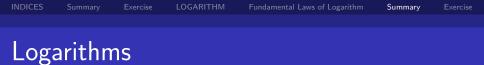
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$\begin{array}{l} \bigstar \quad \log_b a = \log a / \log b \\ \bigstar \quad \log_b a = 1 / \log_a b \end{array}$



★ log_b a = log a/ log b ★ log_b a = 1/ log_a b ★ a^{log_a x} = x (Inverse logarithm Property)



Notes:

★ If base is understood, base is taken as 10 ★ Thus log 10 = 1, log 1 = 0

Notes:

- ☆ If base is understood, base is taken as 10
- ★ Thus $\log 10 = 1$, $\log 1 = 0$

★ Logarithm using base 10 is called Common logarithm and logarithm using base e is called Natural logarithm { e = 2.33 (approx.) called exponential number}.

Notes:

- ☆ If base is understood, base is taken as 10
- ★ Thus $\log 10 = 1$, $\log 1 = 0$
- ★ Logarithm using base 10 is called Common logarithm and logarithm using base e is called Natural logarithm { e = 2.33 (approx.) called exponential number}.



$\log 6 + \log 5$ is expressed as



$\log 6 + \log 5$ is expressed as

Options

(a) $\log 11$ (b) $\log 30$ (c) $\log 5/6$ (d) none of these

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Question $\log 6 + \log 5$ is expressed as

Options

(a) $\log 11$ (b) $\log 30$ (c) $\log 5/6$ (d) none of these

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$\log_2 8$ is equal to



 $\log_2 8$ is equal to

Options (a) 2 (b) 8 (c) 3 (d) none of these

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Options (a) 2 (b) 8 (c) 3 (d) none of these

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$\log 32/4$ is equal to



 $\log 32/4$ is equal to

Options

(a) $\log 32/\log 4$ (b) $\log 32 - \log 4$ (c) 2^3 (d) none of these

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Options

(a) $\log 32/\log 4$ (b) $\log 32 - \log 4$ (c) 2^3 (d) none of these

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$\log(1 \times 2 \times 3)$ is equal to



$\log(1 \times 2 \times 3)$ is equal to

Options

(a) $\log 1 + \log 2 + \log 3$ (b) $\log 3$ (c) $\log 2$ (d) none of these

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Question
$$\log(1 \times 2 \times 3)$$
 is equal to

Options

(a) $\log 1 + \log 2 + \log 3$ (b) $\log 3$ (c) $\log 2$ (d) none of these

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The value of log 0.0001 to the base 0.1 is



The value of log 0.0001 to the base 0.1 is

Options (a) -4 (b) 4 (c) 1/4 (d) none of these



The value of log 0.0001 to the base 0.1 is

Options (a) -4 (b) 4 (c) 1/4 (d) none of these

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If $2 \log x = 4 \log 3$, the x is equal to



If $2 \log x = 4 \log 3$, the x is equal to

Options (a) 3 (b) 9 (c) 2 (d) none of these

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If $2 \log x = 4 \log 3$, the x is equal to

Options (a) 3 (b) 9 (c) 2 (d) none of these

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Question $\log_{\sqrt{2}} 64$ is equal to



$\log_{\sqrt{2}} 64$ is equal to

Options (a) 12 (b) 6 (c) 1 (d) none of these

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Question $\log_{\sqrt{2}} 64$ is equal to

Options

(a) 12 (b) 6 (c) 1 (d) none of these

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$\log_{2\sqrt{3}} 1728$ is equal to



$\log_{2\sqrt{3}} 1728$ is equal to

Options

(a) $2\sqrt{3}$ (b) 2 (c) 6 (d) none of these

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Question $\log_{2\sqrt{3}} 1728$ is equal to

Options

(a) $2\sqrt{3}$ (b) 2 (c) 6 (d) none of these

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log(1/81) to the base 9 is equal to



log(1/81) to the base 9 is equal to

Options (a) 2 (b) 1/2 (c)-2 (d) none of these

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log(1/81) to the base 9 is equal to

Options (a) 2 (b) 1/2 (c)-2 (d) none of these

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log 0.0625*to* the base 2*is* equal to



log 0.0625*to* the base 2*is* equal to

Options (a) 4 (b) 5 (c) 1 (d) none of these



log 0.0625 to the base 2 is equal to

Options (a) 4 (b) 5 (c) 1 (d) none of these

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Given $\log 2 = 0.3010$ and $\log 3 = 0.4771$ the value of $\log 6$ is



Given $\log 2 = 0.3010$ and $\log 3 = 0.4771$ the value of $\log 6$ is

Options

(a) 0.9030 (b) 0.9542 (c) 0.7781 (d) none of these

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Given $\log 2 = 0.3010$ and $\log 3 = 0.4771$ the value of $\log 6$ is

Options

(a) 0.9030 (b) 0.9542 (c) 0.7781 (d) none of these

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The value of $\log_2 \log_2 \log_2 16$



The value of $\log_2 \log_2 \log_2 16$

Options (a) 0 (b) 2 (c) 1 (d) none of these

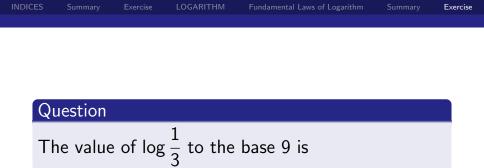


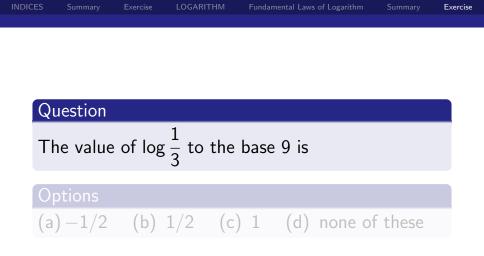
The value of $\log_2 \log_2 \log_2 16$

Options(a) 0(b) 2(c) 1(d) none of these

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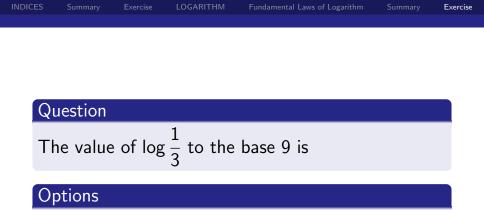
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(a) -1/2 (b) 1/2 (c) 1 (d) none of these

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If $\log x + \log y = \log(x + y)$, y can be expressed as



If $\log x + \log y = \log(x + y)$, y can be expressed as

Options (a) x-1 (b) x (c) x/x - 1 (d) none of these

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If
$$\log x + \log y = \log(x + y)$$
, y can be expressed as

Options (a) x-1 (b) x (c) x/x - 1 (d) none of these

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The value of $\log_2[\log_2\{\log_3(\log 27)\}]$ is equal to



The value of $\log_2[\log_2\{\log_3(\log 27)\}]$ is equal to

Options (a) 1 (b) 2 (c) 0 (d) none of these

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The value of $\log_2[\log_2\{\log_3 (\log 27)\}]$ is equal to

Options(a) 1(b) 2(c) 0(d) none of these

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If $\log_2 x + \log_4 x + \log_{16} x = 21/4$, these x is equal to



If $\log_2 x + \log_4 x + \log_{16} x = 21/4$, these x is equal to

Options

(a) 8 (b) 4 (c) 16 (d) none of these

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If $\log_2 x + \log_4 x + \log_{16} x = 21/4$, these x is equal to

Options (a) 8 (b) 4 (c) 16 (d) none of these

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Given that $\log_{10} 2 = x$ and $\log_{10} 3 = y$, the value of $\log_{10} 60$ is expressed as



Given that $\log_{10} 2 = x$ and $\log_{10} 3 = y$, the value of $\log_{10} 60$ is expressed as

Options

(a) x - y + 1 (b) x + y + 1 (c) x - y - 1(d) none of these

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Given that $\log_{10} 2 = x$ and $\log_{10} 3 = y$, the value of $\log_{10} 60$ is expressed as

Options

(a)
$$x - y + 1$$
 (b) $x + y + 1$ (c) $x - y - 1$
(d) none of these

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Given that $\log_{10} 2 = x$, $\log_{10} 3 = y$, then $\log_{10} 1.2$ is expressed in terms of x and y as



Given that $\log_{10} 2 = x$, $\log_{10} 3 = y$, then $\log_{10} 1.2$ is expressed in terms of x and y as

Options

(a) x + 2y - 1 (b) x + y - 1 (c) 2x + y - 1(d) none of these

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Given that $\log_{10} 2 = x$, $\log_{10} 3 = y$, then $\log_{10} 1.2$ is expressed in terms of x and y as

Options

(a)
$$x + 2y - 1$$
 (b) $x + y - 1$ (c) $2x + y - 1$
(d) none of these

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Given that $\log x = m + n$ and $\log y = m - n$, the value of $\log 10x/y^2$ is expressed in terms of m and n as



Given that $\log x = m + n$ and $\log y = m - n$, the value of $\log 10x/y^2$ is expressed in terms of m and n as

Options

(a)
$$1 - m + 3n$$
 (b) $m - 1 + 3n$ (c) $m + 3n + 1$ (d) none of these

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Given that $\log x = m + n$ and $\log y = m - n$, the value of $\log 10x/y^2$ is expressed in terms of m and n as

Options

(a)
$$1 - m + 3n$$
 (b) $m - 1 + 3n$ (c) $m + 3n + 1$ (d) none of these

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The simplified value of $2\log_{10}5+\log_{10}8-1/2\log_{10}4$ is



The simplified value of $2\log_{10}5+\log_{10}8-1/2\log_{10}4$ is

Options

(a) 1/2 (b) 4 (c) 2 (d) none of these

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The simplified value of $2\log_{10}5+\log_{10}8-1/2\log_{10}4$ is

Options

(a) 1/2 (b) 4 (c) 2 (d) none of these

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$\log[1 - \{1 - (1 - x^2)^{-1}\}^{-1}]^{-1/2}$ can be written as



$$\log[1 - {1 - (1 - x^2)^{-1}}^{-1}]^{-1/2}$$
 can be written as

Options

(a) $\log x^2$ (b) $\log x$ (c) $\log 1/x$ (d) none of these

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INDICES		LOGARITHM	Fundamental Laws of Logarithm	Exercise

$$\log[1 - \{1 - (1 - x^2)^{-1}\}^{-1}]^{-1/2}$$
 can be written as

Options

(a) $\log x^2$ (b) $\log x$ (c) $\log 1/x$ (d) none of these

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The simplified value of log $\sqrt[4]{729\sqrt[3]{9^127^{4/3}}}$ is



The simplified value of $\log \sqrt[4]{729\sqrt[3]{9^127^{4/3}}}$ is

Options

(a) $\log 3$ (b) $\log 2$ (c) $\log^{1/2}$ (d) none of these

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The simplified value of $\log \sqrt[4]{729\sqrt[3]{9^127^{4/3}}}$ is

Options

(a) $\log 3$ (b) $\log 2$ (c) $\log^{1/2}$ (d) none of these

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The value of $(\log_b a \times \log_c b \times \log_a c)^3$ is equal to



The value of $(\log_b a \times \log_c b \times \log_a c)^3$ is equal to

Options (a) 3 (b) 0 (c) 1 (d) none of these

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The value of $(\log_b a \times \log_c b \times \log_a c)^3$ is equal to

Options (a) 3 (b) 0 (c) 1 (d) none of these

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The logarithm of 64 to the base $2\sqrt{2}$ is



The logarithm of 64 to the base $2\sqrt{2}$ is

Options (a) 2 (b) $\sqrt{2}$ (c) 1/2 (d) none of these

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The logarithm of 64 to the base $2\sqrt{2}$ is

Options

(a) 2 (b) $\sqrt{2}$ (c) 1/2 (d) none of these

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The value of log_825 given log 2 = 0.3010 is



The value of log_825 given log 2 = 0.3010 is

Options (a) 1 (b) 2 (c) 1.5482 (d) none of these



The value of log_825 given log 2 = 0.3010 is

Options (a) 1 (b) 2 (c) 1.5482 (d) none of these

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Thank you

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