1. Which of the following statements is not correct?

A. $\log(2\times4\times6) = \log 2 + \log 4 + \log 6$ B. $\log_5 1 = 0$

C. $\log(3+4) = \log(3 \times 4)$ D. $\log_5 5 = 1$

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Here is the answer and explanation

Answer : Option C

Explanation :

$\text{Log}_b b = 1$. Hence $\log_5 5 = 1$

$\text{Log}_b 1 = 0$. Hence $\log_5 1 = 0$

$\log(a \times b) = \log a + \log b$
similarly, $\log(a \times b \times c) = \log a + \log b + \log c$
Hence $\log(2\times4\times6) = \log 2 + \log 4 + \log 6$

$\log(3+4) = \log(3 \times 4)$ is wrong
LHS = $\log(3+4) = \log 7$
RHS = $\log(3 \times 4) = \log(12)$
$\log 7 \neq \log 12$

2. $\text{Log}_5(0)$ = ?

A. None of these B. 5

C. 0 D. 1

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Here is the answer and explanation

Answer : Option A

Explanation :

$\log_b(0)$ is undefined

3. $\frac{\log \sqrt{5}}{\log 5} = ?$

A. $\frac{1}{2}$ B. $\frac{1}{\sqrt{5}}$

C. $\frac{1}{4}$ D. $\frac{1}{8}$

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Here is the answer and explanation

Answer : Option A

Explanation :

$$\frac{\log\sqrt{5}}{\log 5} = \frac{\log(5)^{\frac{1}{2}}}{\log 5} = \frac{\frac{1}{2}\log 5}{\log 5} = \frac{1}{2}$$

4. $\frac{\log\sqrt{6}}{\log\sqrt[3]{6}} = ?$

A. $\frac{1}{3}$ B. $\frac{1}{2}$

C. $\frac{3}{2}$ D. $\frac{2}{3}$

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Here is the answer and explanation

Answer : Option C

Explanation :

$$\frac{\log\sqrt{6}}{\log\sqrt[3]{6}} = \frac{\log(6)^{\frac{1}{2}}}{\log(6)^{\frac{1}{3}}} = \frac{\frac{1}{2}\log 6}{\frac{1}{3}\log 6} = \frac{3}{2}$$

5. If $\log\frac{a}{b} + \log\frac{b}{a} = \log(a+b)$, then

A. a = b B. a + b = 1

C. a - b = 1 D. $a^2 - b^2 = 1$

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Here is the answer and explanation

Answer : Option B

Explanation :

$$\log\frac{a}{b} + \log\frac{b}{a} = \log(a+b)$$

$$\log\left(\frac{a}{b} \times \frac{b}{a}\right) = \log(a+b)$$

$$\log(1) = \log(a+b)$$

$$a+b = 1$$

6. If log(64)= 1.806, log(16) = ?

A. 1.204 B. 0.903

C. 1.806 D. None of these

| Discuss

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Here is the answer and explanation

Answer : Option A

Explanation :

log(64)= 1.806

=> $\log(4^3) = 1.806$

=> 3log(4) = 1.806

$$\Rightarrow \log(4) = \frac{1.806}{3}$$

$$\log(16) = \log(4^2) = 2\log(4) = 2 \times \frac{1.806}{3} = 2 \times 0.062 = 1.204$$

7. If log 2 = 0.3010 and log 3 = 0.4771, What is the value of $\log_5 1024$?

A. 4.31 B. 3.88

C. 3.91 D. 2.97

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Here is the answer and explanation

Answer : Option A

Explanation :

$$\log_5 1024 = \frac{\log 1024}{\log 5} = \frac{\log(2^{10})}{\log(\frac{10}{2})} = \frac{10\log(2)}{\log 10 - \log 2}$$

$$= \frac{10 \times 0.3010}{1 - 0.3010} = \frac{3.01}{0.699} = \frac{3010}{699} = 4.31$$

8. if log 2 = 0.30103 and log 3 = 0.4771, find the number of digits in $(648)^5$.

A. 15 B. 14

C. 13 D. 12

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Here is the answer and explanation

Answer : Option A

Explanation :

$\log(648)^5$ = 5 log(648) = 5 log(81 × 8)

= 5 [log(81) + log(8)] = 5 [log(3^4) + log(2^3)] = 5 [4log(3) + 3log(2)]

= 5 [4 × 0.4771 + 3 × 0.30103] = 5(1.9084 + 0.90309)

= 5 × 2.81149 ≈ 14.05

ie, $\log(648)^5 \approx 14.05$

ie, its characteristic = 14

Hence, number of digits in $(648)^5$ = 14+1 = 15

9. if log 2 = 0.30103, the number of digits in 2^{128} is

A. 38 B. 39

C. 40 D. 41

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Here is the answer and explanation

Answer : Option B

Explanation :

$\log(2^{128}) = 128\log(2) = 128 \times 0.30103 \approx 38.4$

ie, its characteristic = 38

Hence, number of digits in 2^{128} = 38+1 = 39

10. $\log_x (\frac{9}{32}) = -\frac{1}{8}$, find the value of x

A. $(\frac{9}{32})^8$ B. $(\frac{9}{32})^2$

C. $(\frac{32}{9})^8$ D. $(\frac{32}{9})^2$

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_x (\frac{9}{32}) = -\frac{1}{8}$

$\Rightarrow x^{-1/8} = \frac{9}{32}$

$\Rightarrow \frac{1}{x^{1/8}} = \frac{9}{32}$

$\Rightarrow x^{1/8} = \frac{32}{9}$

$x = (\frac{32}{9})^{8}$

11. $\log_x (\frac{9}{4}) = -\frac{1}{2}$, find the value of x

A. $\frac{81}{16}$ B. $\frac{16}{9}$

C. $\frac{16}{81}$ D. $\frac{9}{16}$

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_x (\frac{9}{4}) = -\frac{1}{2}$

$\Rightarrow x^{-1/2} = \frac{9}{4}$

$\Rightarrow \frac{1}{x^{1/2}} = \frac{9}{4}$

$\Rightarrow x^{1/2} = \frac{4}{9}$

$x = (\frac{4}{9})^{2} = \frac{16}{81}$

12. if $a^x = b^y$, then

A. $\frac{\log a}{\log b} = \frac{x}{y}$ B. None of these

C. $\log \frac{a}{b} = \frac{x}{y}$ D. $\frac{\log a}{\log b} = \frac{y}{x}$

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Here is the answer and explanation

Answer : Option D

Explanation :

$a^x = b^y$

$\log(a^x) = \log(b^y)$

$x \log a = y \log b$

$\frac{\log a}{\log b} = \frac{y}{x}$

13. $\log_2 512 = ?$

A. 10 B. 6

C. 9 D. 8

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_2 512 = \log_2 (2^9) = 9$

14. If $\log_x y = 10$ and $\log_2 x = 1000$, what is the value of y?

A. 2^{100} B. 2^{1000}

C. 2^{10000} D. 2^{10}

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_2 x = 1000 \Rightarrow x = 2^{1000}$

$\log_x y = 10$

$\Rightarrow y = x^{10} = (2^{1000})^{10}$

$= 2^{(1000 \times 10)} = 2^{10000}$

15. if $\log_{10}2 = 0.3010$, what is the value of $\log_{10}1600$?

A. None of these
B. 5.204
C. 1.204
D. 3.204

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Here is the answer and explanation

Answer : Option D

Explanation :

$\log_{10}1600 = \log_{10}(16 \times 100)$

$= \log_{10}(16) + \log_{10}(100)$

$= \log_{10}(2^4) + \log_{10}(10^2)$

$= 4\log_{10}(2) + 2 = (4 \times 0.3010) + 2 = 1.204 + 2 = 3.204$

16. $\frac{1}{\log_2 48} + \frac{1}{\log_4 48} + \frac{1}{\log_6 48} = ?$

A. -1
B. 2
C. 0
D. 1

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Here is the answer and explanation

Answer : Option D

Explanation :

$\frac{1}{\log_2 48} + \frac{1}{\log_4 48} + \frac{1}{\log_6 48}$

$= \log_{48} 2 + \log_{48} 4 + \log_{48} 6$

$= \log_{48}(2 \times 4 \times 6)$

$= \log_{48}(48)$

$= 1$

17. If $\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$, then x is equal to:

A. 4
B. 3
C. 2
D. 1

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Here is the answer and explanation

Answer : Option B

Explanation :

$\log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + 1$

$\Rightarrow \log_{10} 5 + \log_{10} (5x + 1) = \log_{10} (x + 5) + \log_{10} 10$

$\Rightarrow \log_{10} [5(5x+1)] = \log_{10} [10(x+5)]$

$\Rightarrow 5(5x+1) = 10(x+5)$

$\Rightarrow 5x+1 = 2(x+5)$

$\Rightarrow 5x + 1 = 2x + 10$

$\Rightarrow 3x = 9$

$\Rightarrow x = 3$

18. If $\log_{10} 2 = a$, what is the value of $\log_{10} (\frac{1}{200})$

A. -(a+2)
B. -(a+1)
C. (a+2)
D. (a+1)

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Here is the answer and explanation

Answer : Option A

Explanation :

$\log_{10} (\frac{1}{200})$

$= \log_{10} 1 - \log_{10} 200$

$= 0 - \log_{10} (2 \times 100)$

$= -[\log_{10} 2 + \log_{10} 100]$

$= -(a + 2)$

19. If $\log_{10} 3 = 0.4771$, then $\log_3 10$ is

A. $\frac{1000}{4771}$
B. $\frac{10000}{4771}$
C. 1.4313
D. 0.4771

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Here is the answer and explanation

Answer : Option B

Explanation :

$$\log_3 10 = \frac{1}{\log_{10} 3} = \frac{1}{0.4771} = \frac{10000}{4771}$$

20. If $\log_5 (x^2+x) - \log_5 (x+1) = 3$, find the value of x

A. 25 B. 125

C. 1/125 D. 1/25

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Here is the answer and explanation

Answer : Option B

Explanation :

$$\log_5(x^2 + x) - \log_5(x + 1) = 3$$

$$\Rightarrow \log_5 (\frac{x^2 + x}{x + 1}) = 3$$

$$\Rightarrow \log_5 [\frac{x(x + 1)}{x + 1}] = 3$$

$$\Rightarrow \log_5 x = 3$$

$$\Rightarrow x = 5^3 = 125$$

21. Find the value of $\frac{1}{3} \log_{10} 125 - 2 \log_{10} 4 + \log_{10} 32$

A. 0 B. 1

C. 2 D. 3

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Here is the answer and explanation

Answer : Option B

Explanation :

$\frac{1}{3}\log_{10} 125 - 2\log_{10} 4 + \log_{10} 32$

$=\log_{10}(125^{1/3}) - \log_{10}(4^2) + \log_{10} 32$

$= \log_{10} 5 - \log_{10} 16 + \log_{10} 32$

$= \log_{10}(\frac{5 \times 32}{16})$

$= \log_{10}(10)$

$= 1$

22. $\log(\frac{a^2}{bc}) + \log(\frac{b^2}{ac}) + \log(\frac{c^2}{ab}) = ?$

A. None of these
B. abc
C. 1
D. 0

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Here is the answer and explanation

Answer : Option D

Explanation :

$\log(\frac{a^2}{bc}) + \log(\frac{b^2}{ac}) + \log(\frac{c^2}{ab})$

$= \log(\frac{a^2}{bc} \times \frac{b^2}{ac} \times \frac{c^2}{ab}) = \log(1) = 0$

23. if $\log_2 x = -6$, x is equal to :

A. 64
B. $\frac{1}{64}$
C. $\frac{1}{32}$
D. 32

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Here is the answer and explanation

Answer : Option B

Explanation :

$\log_2 x = -6$

$\Rightarrow x = (2)^{-6} = \frac{1}{2^6} = \frac{1}{64}$

24. If $\log_4 x + \log_2 x = 12$, then x is equal to:

A. 1024 B. 256

C. 8 D. 16

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Here is the answer and explanation

Answer : Option B

Explanation :

$$\log_4 x + \log_2 x = 12$$

$$\Rightarrow \frac{\log x}{\log 4} + \frac{\log x}{\log 2} = 12$$

$$\Rightarrow \frac{\log x}{\log 2^2} + \frac{\log x}{\log 2} = 12$$

$$\Rightarrow \frac{\log x}{2\log 2} + \frac{\log x}{\log 2} = 12$$

$$\Rightarrow \frac{\log x + 2\log x}{2\log 2} = 12$$

$$\Rightarrow \frac{3\log x}{2\log 2} = 12$$

$$\Rightarrow \log x = \frac{12 \times 2\log 2}{3} = 8\log 2 = \log(2^8) = \log(256)$$

$$\Rightarrow x = 256$$

25. $\log_{(.001)}(100) = ?$

A. $\frac{-2}{3}$ B. $\frac{3}{2}$

C. $\frac{-3}{2}$ D. None of these

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Here is the answer and explanation

Answer : Option A

Explanation :

Let $\log_{(.001)}(100) = p$

$(.001)^p = 100$

$(\frac{1}{1000})^p = 100$

$(\frac{1}{10^3})^p = 10^2$

$[(10)^{-3}]^p = 10^2$

$(10)^{-3p} = 10^2$

$-3p = 2$

$p = \frac{-2}{3}$

26. $\log_5 200 \times \log_{200} 125$ equals :

A. 5 B. 25

C. 3 D. 6

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_5 200 \times \log_{200} 125 = \frac{\log 200}{\log 5} \times \frac{\log 125}{\log 200}$

$= \frac{\log 125}{\log 5} = \log_5 125 = \log_5 (5^3) = 3$

27. If $\log_{100}[\log_3(\log_2 x)] = 1$, x is equal to:

A. None of these B. 1

C. $2^{(3^{100})}$ D. $3^{(2^2)}$

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Here is the answer and explanation

Answer : Option C

Explanation :

$\log_{100}[\log_3(\log_2 x)] = 1$

$\log_{100}[\log_3(\log_2 x)] = \log_{100}(100)$

$\log_3(\log_2 x) = 100$

$\log_2 x = 3^{100}$

$x = 2^{(3^{100})}$

28. If $\log_2[\log_3(\log_2 x)] = 1$, x is equal to:

A. 512 B. None of these

C. 256 D. 1024

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

$\log_2[\log_3(\log_2 x)] = 1$

$\log_2[\log_3(\log_2 x)] = \log_2(2)$

$\log_3(\log_2 x) = 2$

$\log_2 x = 3^2 = 9$

$x = 2^9 = 512$

29. $(\log_3 4)\ (\log_4 5)\ (\log_5 6)\ (\log_6 7)\ (\log_7 8)\ (\log_8 9)\ (\log_9 9) = ?$

A. 4 B. 0

C. 2 D. 1

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Here is the answer and explanation

Answer : Option C

Explanation :

$$\log_3 4 \times \log_4 5 \times \log_5 6 \times \log_6 7 \times \log_7 8 \times \log_8 9 \times \log_9 9$$
$$= \frac{\log 4}{\log 3} \times \frac{\log 5}{\log 4} \times \frac{\log 6}{\log 5} \times \frac{\log 7}{\log 6} \times \frac{\log 8}{\log 7} \times \frac{\log 9}{\log 8} \times 1$$
$$= \frac{\log 9}{\log 3} = \frac{\log 3^2}{\log 3} = \frac{2\log 3}{\log 3} = 2$$

30. $\log_{(-2)}(-2) = ?$

A. None of these B. -1

C. 0 D. 1

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Here is the answer and explanation

Answer : Option A

Explanation :

$\log_b x$ is undefined for $x \leq 0$