

1. What is the exact value of x : $7 = 2^{x+1}$

A) $\log\left(\frac{7}{2}\right) - 1$

B) $\frac{\log 7}{\log 2} + 1$

C) $\log\left(\frac{7}{2}\right) + 1$

D) $\frac{\log 7}{\log 2} - 1$

$$\log 7 = (x+1) \log 2$$

$$x+1 = \frac{\log 7}{\log 2}$$

2. Solve for x : $2^{3x-1} = 8^{2x+1}$

A) $x = -\frac{4}{3}$

B) $x = -1$

C) $x = -\frac{2}{3}$

D) $x = -\frac{3}{4}$

$$(3x-1) \log 2 = (2x+1) \log 8$$

$$3x \log 2 - 2x \log 8 = \log 8 + \log 2$$

$$x = \frac{\log 8 + \log 2}{3 \log 2 - 2 \log 8}$$

$$= -\frac{4}{3}$$

3. Express $\log\left(\frac{x^2}{10y^3}\right)$ in terms of $\log x$ and $\log y$.

A) $2 \log x - 1 - 3 \log y$

B) $2 \log x - 1 + 3 \log y$

C) $2 \log x - 10 - 3 \log y$

D) $2 \log x - 10 + 3 \log y$

$$2 \log x - [\log 10 + 3 \log y]$$

$$2 \log x - 1 - 3 \log y$$

4. What is the value of $\log_3 \sqrt{27}$?

A) $x = \frac{2}{9}$

B) $x = \frac{2}{3}$

C) $x = \frac{3}{2}$

D) $x = \frac{9}{2}$

$$3^x = \sqrt{27}$$

$$3^x = 3^{3/2}$$

$$x = 3/2$$

5. What is the x -intercept of $y = \log_2(x+7)$?

A) -7

B) -6

C) 0

D) 3

$$0 = \log_2(x+7)$$

$$x = -6$$

$$2^0 = x+7$$

$$1 = x+7$$

6. If $\log_2 5 = x$, then $\log_2 \sqrt[3]{25^3}$ is equivalent to which expression?

A) $\frac{3x}{2}$

B) $\frac{3x}{8}$

C) $x^{\frac{3}{2}}$

D) $x^{\frac{3}{8}}$

$$\log_2 25^{3/4}$$

$$\frac{3}{4} \log_2 25$$

$$\frac{3}{4} \log_2 5^2$$

$$2\left(\frac{3}{4}\right) \log_2 5$$

$$\rightarrow \frac{3}{2} x$$

7. What is the value of x : $3\left(5^{\frac{x}{2}}\right) = 12$?

A) $\frac{\log 5}{2 \log 4}$

B) $\frac{2 \log 5}{\log 4}$

C) $\frac{\log 4}{2 \log 5}$

D) $\frac{2 \log 4}{\log 5}$

$5^{\frac{x}{2}} = 4$
 $\frac{x}{2} \log 5 = \log 4$
 $\frac{x}{2} = \frac{\log 4}{\log 5}$
 $x = \frac{2 \log 4}{\log 5}$

8. Solve for x : $(2x-1)^2 = \sqrt{3}$.

A) 0.74

B) 1.37

C) 2

D) 2.73

$2x-1 = 3$
 $2x = 4$
 $x = 2$

9. What is the inverse of $y = 3^x$?

A) $y = \log_x 3$

B) $y = \log_3 x$

C) $x = \log_3 y$

D) $x = \log_y 3$

$x = 3^y$
 $\log_3 x = y$

10. Solve for x : $\log_5(5x+2) = \frac{1}{2} \log_5 49 + \log_5 16$.

A) 4.2

B) 22

C) 78

D) 156.4

$\log_5(5x+2) = \log_5(7)(16)$
 $5x+2 = 112$
 $5x = 110$
 $x = 22$

11. Which is $m \log_p n = q$ written in exponential form?

A) $p^m = n^q$

B) $p^q = n^m$

C) $p^q = mn$

D) $p^{qm} = n$

$\log_p n^m = q$
 $p^q = n^m$

12. Solve for x : $\log_7(2x) + \log_7(x-3) = \log_7 8$

A) $x = 1$

B) $x = 4$

C) $x = 5$

D) $x = 6$

$(2x)(x-3) = 8$
 $2x^2 - 6x = 8$
 $2x^2 - 6x - 8 = 0$
 $2(x^2 - 3x - 4) = 0$
 $(x-4)(x+1) = 0$
 $x = 4$ or $x = -1$

13. Solve for x : $4^{x+1} = 3(7^{2x})$.

A) $\frac{-\log 4}{\log 4 - 2 \log 21}$

B) $\frac{-\log 4}{1 - 2 \log 21}$

C) $\frac{\log 3 - \log 4}{\log 4 - 2 \log 7}$

D) $\frac{\log 3 - \log 4}{1 - 2 \log 7}$

$(x+1) \log 4 = \log 3 + 2x \log 7$
 $x \log 4 + \log 4 = \log 3 + 2x \log 7$
 $x \log 4 - 2x \log 7 = \log 3 - \log 4$

$x(\log 4 - 2 \log 7) = \log 3 - \log 4$
 $x = \frac{\log 3 - \log 4}{\log 4 - 2 \log 7}$

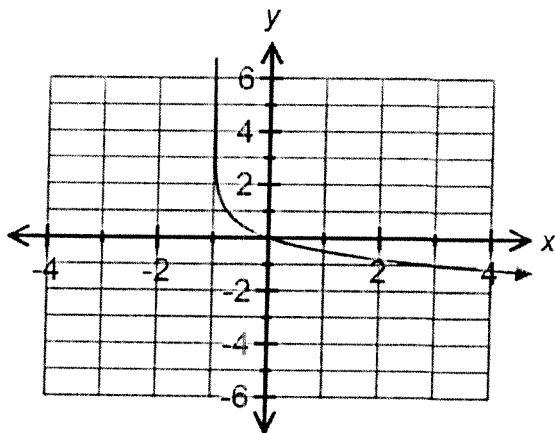
14. Which function best represents the graph shown below?

~~A) $y = -\log_4(x-1)$~~

B) $y = -\log_4(x+1)$

~~C) $y = \log_4(x-1)$~~

D) $y = \log_4(x+1)$



VA $x = -1$

15. Which expression is equivalent to $\log \frac{\sqrt{BA}}{C^4}$?

A) $\frac{1}{2} \log B + \log A - 4 \log C$

B) $\frac{1}{2} \log B + 4 \log \frac{A}{C}$

C) $\frac{\frac{1}{2} \log(B+A)}{4 \log C}$

D) $\frac{\frac{1}{2} \log B + \log A}{4 \log C}$

$\frac{1}{2} \log B + \log A - 4 \log C$

16. What is the domain of $y = \log_3(5-x)$?

A) $x > 5, x \in \mathbb{R}$

$(-x + 5)$

B) $x > -5, x \in \mathbb{R}$

$x \leq 5$

C) $x < 5, x \in \mathbb{R}$

$-x = -5$
 $x = 5$

$x < -5, x \in \mathbb{R}$

17. What is the domain of $y = 3 \log_2(-2(x-4)) + 7$?

A) $x > 4, x \in \mathbb{R}$

B) $x < 4, x \in \mathbb{R}$

C) $x > -8, x \in \mathbb{R}$

D) $x < -8, x \in \mathbb{R}$

$-2(x-4) = 0 \rightarrow x = 4$

18. What is the value of x : $\log_x 125 = \frac{3}{2}$

A) 5

B) 10

C) 25

D) 125

$x^{3/2} = 125$
 $x = 125^{2/3}$
 $= 25$