

Algebra 2B

8.6 - Practice

Solve.

1. Use the formula $\log_b M = \frac{\log_a M}{\log_a b}$ to change $\log_8 12$ to a base 10 log.

$$\frac{\log 12}{\log 8}$$

2. Use the formula $\log_b M = \frac{\log_a M}{\log_a b}$ to change $\log_3 95$ to a base 10 log.

$$\frac{\log 95}{\log 3}$$

3. Use the formula $\log_b M = \frac{\log_a M}{\log_a b}$ to change $\log_8 n$ to a base 10 log.

$$\frac{\log n}{\log 8}$$

4. Use the formula $\log_b M = \frac{\log_a M}{\log_a b}$ to change $\log_9 7.49$ to a base 10 log. Then find the value of the log to the nearest ten-thousandth.

$$\frac{\log 7.49}{\log 9} = \boxed{0.9164}$$

5. $5^x = 125$

$$\boxed{x=3}$$

6. $3^x = 243$

$$\boxed{x=5}$$

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7. $3^x = \frac{1}{27}$

$$3^x = 3^{-3}$$

$$\boxed{x=-3}$$

8. $2^{-x} = 128$

$$2^{-x} = 2^7$$

$$-x = 7$$

$$\boxed{x=-7}$$

9. $64^{x-4} = \left(\frac{1}{2}\right)^{2x}$

$$2^{6(x-4)} = 2^{-(2x)}$$

$$6x - 24 = -2x$$

$$8x = 24$$

$$\boxed{x=3}$$

10. $2^x = 81$

$$2^x = 3^4$$

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$$\log_2 81 = x$$

$$\approx \boxed{6.341}$$

11. $10^x = 6$

$$\log_{10} 6 = x$$

$$\approx \boxed{0.78}$$

12. $6^{x+2} = 12$

$$\log_6 12 = x+2$$

$$x \approx \boxed{-0.61}$$

$$\frac{\log 12}{\log 6} - 2 = x$$

13. $3^{2x+1} = 15$

$$\log_3 15 = 2x+1$$

$$\log_3 15 - 1 = 2x$$

$$x = \frac{\log_3 15 - 1}{2}$$

$$x \approx \boxed{0.73}$$

14. $2^{x+4} = 3^{2x-3}$

$$\log_2 3^{2x-3} = x+4$$

SKIP

$$2x - 3 \log_2 3 = x + 4$$

$$\underline{2x - 3}$$

15. $\log_8(2x+1) = -1$

$$8^{-1} = 2x+1$$

$$(8)^{\frac{1}{8}} = (2x+1)(8)$$

$$1 = 16x + 8$$

$$-7 = 16x$$

$$\frac{-7}{16} = x$$

16. $6 = \log(x^2+4)^3$

$$6 = 3 \log(x^2+4)$$

$$2 = \log(x^2+4)$$

$$100 = x^2+4$$

$$96 = x^2$$

$$\pm 476 = x$$

17. $4 = \log_3(8s+9)$

$$3^4 = 8s+9$$

$$81 - 9 = 8s$$

$$72 = 8s$$

$$s = 9$$

18. $\log_3 10 - \log_3 5 = \log_3 n$

$$\log_3 2 = \log_3 n$$

$$2 = n$$

19. $\log_3 x^{-5} = -10$

$$3^{-10} = x^{-5}$$

$$-5 \log_3 x = -10$$

$$\log_3 x = 2$$

$$3^2 = x$$

$$9 = x$$

20. $\log_2 x^3 = 6$

$$3 \log_2 x = 6$$

$$\log_2 x = 2$$

$$2^2 = x$$

$$x = 4$$

21. $\log_2 y = 5$

$$2^5 = y$$

$$32 = y$$

22. $\log_9 3 = x$

$$9^x = 3$$

$$x = \frac{1}{2}$$

$$3^{2x} = 3^1$$

$$2x = 1$$

$$x = \frac{1}{2}$$

23. $\log_y 64 = 3$

$$y^3 = 64$$

$$y = 4$$

24. $\log(2-3x) = 0$

$$10^0 = 2-3x$$

$$1 = 2-3x$$

$$-2 = -3x$$

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

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

25. $\log_8(2x+1) = -1$

$$8^{-1} = 2x+1$$

$$\frac{1}{8} = 2x+1$$

Skip

already done.