

25 pt

Name key Date _____ Period _____

Review

Solve each equation.

1. $3x - 7 = -5x + 9$
 $+5x + 7 \quad +5x + 7$

$8x = 16$

$x = 2$ +1

$\frac{14}{-7} = 2$

2. $x^2 - 5x = 14$

$x^2 - 5x - 14 = 0$

$(x-7)(x+2) = 0$

$x-7=0 \quad x+2=0$

$x=7 \quad x=-2$

+1 +1

3. $3x^2 - 16x - 12 = 0$

$3x^2 - 18x + 2x - 12 = 0$

$3x(x-6) + 2(x-6) = 0$

$(3x+2)(x-6) = 0$

$\frac{-36}{-18} = 2$

$3x+2=0 \quad x-6=0$

$x = -\frac{2}{3} \quad x=6$ +1

4. $\sqrt{x+9} - 13 = 21$

$(\sqrt{x+9} = 34)^2$

$x+9 = 1156$

$x = 1147$ +1

restriction
 $x > -9$

Change each exponential statement into an equivalent statement involving a logarithm.

5. $7 = x^2$

$\log_x 7 = 2$ +1

6. $2^{(-3)} = \frac{1}{8}$

$\log_2 \frac{1}{8} = -3$

+1

7. $5^x = 8.4$

$\log_5 8.4 = x$

+1

Change each logarithmic statement to an equivalent statement involving an exponent.

9. $\log_5 125 = 3$

$5^3 = 125$

+1

10. $\log_8 4 = \frac{2}{3}$

$8^{2/3} = 4$

+1

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

$10^x = 6$

+1

12. $\ln x = 9$

$e^9 = x$

+1

Solve each equation. Leave answer as exact solutions. No calculators. Show work!

13. $\log_2(2x+1) = 3$

$2^3 = 2x+1$

$8 = 2x+1$

$7 = 2x$

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

14. $\ln e^x = 5$

$e^5 = e^x$

$5 = x$ +1

$$15. \log_4 64 = x$$

$$4^x = 64$$

$$4^x = 4^3$$

$$\boxed{x=3} \quad +1$$

$$17. e^{2x+5} = 8$$

$$\ln 8 = 2x+5$$

$$\ln(8) - 5 = 2x$$

$$\boxed{\frac{\ln(8) - 5}{2} = x} \quad +1$$

$$19. \frac{2 \cdot 10^{2-x}}{2} = \frac{5}{2}$$

$$\boxed{10^{2-x} = \frac{5}{2}}$$

$$\boxed{-\log\left(\frac{5}{2}\right) - 2 = -x} \quad +1$$

$$\log \frac{5}{2} = 2 - x$$

$$\log\left(\frac{5}{2}\right) - 2 = -x$$

$$21. \log_3 x = -5$$

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

$$\boxed{x = \frac{1}{243}} \quad +1$$

$$3^4 = 81$$

$$\frac{81}{3} = 27$$

$$23. 3^{2x-5} = 7$$

$$\log_3 7 = 2x - 5$$

$$\log_3(7) + 5 = 2x$$

$$\boxed{\frac{\log_3(7) + 5}{2} = x} \quad +1$$

$$16. \log_3 243 = 2x + 1$$

$$\log_3(243) - 1 = 2x$$

$$\boxed{\frac{\log_3(243) - 1}{2} = x} \quad +1$$

$$\text{or } \frac{\log_3 3^5 - 1}{2} = x$$

$$\frac{5-1}{2} = \frac{4}{2} = 2$$

$$18. \log_2 8^x = -3$$

$$2^{-3} = 8^x$$

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

$$-3 = 3x$$

$$\boxed{x = -1} \quad +1$$

$$20. 4 \cdot e^{x+1} = 5$$

$$\frac{4}{4} \cdot \frac{e^{x+1}}{4} = \frac{5}{4}$$

$$e^{x+1} = \frac{5}{4}$$

$$\ln \frac{5}{4} = x+1$$

$$\boxed{\ln\left(\frac{5}{4}\right) - 1 = x} \quad +1$$

$$22. \log_x 49 = 2$$

$$x^2 = 49$$

$$x^2 = 7^2$$

$$\boxed{x = 7} \quad +1$$

$$24. 10^x = e$$

$$\boxed{\log_e e = x} \quad +1$$