

Key

6.1-6.3 Review

Rewrite each equation in exponential form.

1) $\log_7 49 = 2$

$$7^2 = 49$$

2) $\log_{18} 324 = 2$

$$18^2 = 324$$

3) $\log_{19} 361 = 2$

$$19^2 = 361$$

4) $\log_9 \frac{1}{81} = -2$

$$9^{-2} = \frac{1}{81}$$

Rewrite each equation in logarithmic form.

5) $13^2 = 169$

$$\log_{13} 169 = 2$$

6) $14^{-2} = \frac{1}{196}$

$$\log_{14} \frac{1}{196} = -2$$

7) $16^{\frac{1}{2}} = 4$

$$\log_{16} 4 = \frac{1}{2}$$

8) $17^{-2} = \frac{1}{289}$

$$\log_{17} \frac{1}{289} = -2$$

Evaluate each expression.

9) $\log_7 \frac{1}{49}$

$$7^{\square} = \frac{1}{49}$$

$$\textcircled{-2}$$

10) $\log_3 81$

$$3^{\square} = 81$$

$$\textcircled{4}$$

11) $\log_2 4$

$$2^{\square} = 4$$

$$\textcircled{2}$$

12) $\log_3 9$

$$3^{\square} = 9$$

$$\textcircled{2}$$

13) $\log_3 27$ $3^3 = 27$
 (3)

14) $\log_7 49$
 $7^2 = 49$
 (2)

15) $\log_5 \frac{1}{25}$
 $5^{-2} = \frac{1}{25}$
 (-2)

16) $\log_2 \frac{1}{8}$
 $2^{-3} = \frac{1}{8}$ (-3)

17) Does the following expression represent exponential growth or decay?

$f(x) = 0.25 \cdot (1.001)^x$
 growth
 $b > 1$

18) Does the following expression represent exponential growth or decay?

$f(x) = 973 \cdot (0.97)^x$
 decay
 $0 < b < 1$

19) Find the total amount if \$4000 is invested for 12 years at 4.73% interest, compounded quarterly.

$y = a(1 + \frac{r}{n})^{nt}$
 $y = 4000(1 + \frac{.0473}{4})^{48}$
 \$7032.00

20) Find the total amount if \$3500 is invested for 15 years at 7.25% interest compounded daily.

$y = 3500(1 + \frac{.0725}{365})^{365 \cdot 15}$
 $y = \$10,382.85$

21) A certain strain of bacteria triples every 20 minutes. If the culture started with 10 cells, how many cells will there be after 3 hours?

$y = 10(3)^9$ $t=9$

196,830 cells

22) A certain strain of bacteria triples every 45 minutes. How much bacteria do you have after 3 hours if your starting amount is 10 mg?

$y = 10(3)^4$ $t=4$
 $y = a(b)^x$
 starting double triple etc.
 810 mg

23) You invest \$15,000 at 4.5% each year, how much will your investment be worth after 10 years?

$y = 15000(1 + .045)^{10}$
 $y = \$23,294.54$

24) You purchased a car 7 years ago for \$18,000. If it depreciates at a rate of 6.5% each year, how much is it worth now?

$y = a(1-r)^t$
 $y = 18,000(1 - .065)^7$
 $y = \$11,244.85$

25) You invest \$9,000 at 4% each year, how much will your investment be worth after 20 years?

$$y = 9000(1 + .04)^{20}$$

$$y = \$21,705.43$$

27) You invest \$15,750 at 6.3% compounded continuously, how much will your investment be worth after 15 years?

$$y = Pe^{rt}$$

$$y = 15,750e^{(.063)(15)}$$

$$y = \$40,521.81$$

Simplify.

29) $\log_8 64^{3x}$

$$3x$$

31) $\log_3 81^{-2x}$

$$\log_3 (3^4)^{-2x}$$

$$\log_3 3^{-8x}$$

$$= -8x$$

33) $4e^4 \cdot 5e^{-3}$

$$20e$$

35) $(7e^{4x})^3$

$$7^3 e^{12x}$$

$$343e^{12x}$$

26) You bought a computer for \$2500 that depreciates at a rate of 1.5% each year, how much will your computer be worth in 5 years?

$$y = 2500(1 - .015)^5$$

$$y = \$2,318.04$$

28) You invest \$2850 at 3.25% compounded continuously, how much will your investment be worth after 18 years?

$$y = Pe^{rt}$$

$$y = 2850e^{(.0325)(18)}$$

$$y = \$5,115.72$$

30) $\log_2 16^x$

$$\log_2 (2^4)^x$$

$$\log_2 2^{4x}$$

$$4x$$

32) $2e \cdot 4e^3$

$$8e^4$$

34) $(12e^8)^2$

$$12^2 e^{16}$$

$$144e^{16}$$

36) $\frac{12e^{15-3}}{4e^3}$

$$3e^{12}$$

