

Name key Date _____ Hour _____



Review 9.4 and 9.6

Algebra 2 Trig G



Evaluate each log. Round answers to four decimal places.

1) $\log 41$

1.6128

2) $\log \left(\frac{7}{4} \right)$

0.2430

3) $\log \sqrt{35}$

0.7720

4) $\log (-1)$

\emptyset

Change each log expression to common logs. Then round answers to four decimal places.

5) $\log_5 13$

$\frac{\log 13}{\log 5}$

1.5937

6) $\log_2 72$

$\frac{\log 72}{\log 2}$

6.1699

7) $\log_8 \left(\frac{3}{4} \right)$

$\frac{\log \frac{3}{4}}{\log 8}$

-0.1383

8) $\log_{\frac{1}{3}} 100$

$\frac{\log 100}{\log \frac{1}{3}}$

-4.1918

Solve each equation below. Round final answers to the nearest hundredth (2 decimal places).

9) $3^x = 89$

$x \cdot \log 3 = \log 89$

$x = 4.0857$

10) $7^{x^2} = 29$

$x^2 \cdot \log 7 = \log 29$

$x^2 = 1.7304$

$x = 1.3155$

11) $4^{5x-6} = 128$

$(5x-6) \log 4 = \log 128$

$5x-6 = 3.5$

$5x = 9.5$

$x = 1.9$

12) $9^{2x+1} = 76$

$(2x+1) \cdot \log 9 = \log 76$

$2x+1 = 1.9710$

$2x = 0.9710$

$x = 0.4855$

Use the equation $A = P \left(1 + \frac{r}{k} \right)^{kt}$ to answer the questions below. Round answers to the nearest hundredth (2 decimal places).

13) Bill Gates invests \$500,000 in an account that earns 5% interest compounded six times per year. How long will it take him to have \$1,000,000 in his account?

$$1000000 = 500000 \left(1 + \frac{.05}{6} \right)^{6t}$$

$$2 = (1.0083)^{6t}$$

$$\log 2 = 6t \cdot \log 1.0083$$

$$83.8578 = 6t$$

$$13.98 = t$$

years



14) You put \$20.00 in an account that earns 8% interest compounded quarterly. How long will it take your account to reach \$100.00?

$$100 = 20 \left(1 + \frac{.08}{4} \right)^{4t}$$

$$5 = 1.02^{4t}$$

$$\log 5 = 4t \cdot \log 1.02$$

$$81.2740 = 4t$$

$$20.32 = t$$

years



Use the equation $y = a \cdot b^x$ to answer the questions below. Round answers to 4 decimal places.

15) The population of Paris, France was 1,600,000 in the year 2000. In 2007, the population reached 2,200,000. Determine the rate of growth per year for Paris.

$$2,200,000 = 1,600,000(b)^7$$

$$(1.375)^{\frac{1}{7}} = (b^7)^{\frac{1}{7}}$$

$$1.0465 = b$$



16) The equation $y = 800 \cdot (1.015)^x$ represents the population of students at Greendale High School since 1995. Use this equation to predict the following:

a) The student population in 2011.

$$2011 - 1995 = 16$$

$$y = 800(1.015)^{16}$$

$$y = 1015 \text{ students}$$



b) How many years will it take the population to reach 2,000 students?

$$2000 = 800(1.015)^x$$

$$2.5 = 1.015^x$$

$$\log 2.5 = x \cdot \log 1.015$$

$$61.54 = x$$

years

17) A population of grasshoppers begins with 3 and triples every month. After how many months will there be 900,000 grasshoppers?

$$900,000 = 3(3)^x$$

$$300,000 = 3^x$$

$$\log 300,000 = x \cdot \log 3$$

$$11.48 = x$$

months

