Name KEY Algebra 2 Practice Quiz 7.1 - 7.4

1. Explain (or show) how to evaluate the logarithm without using a calculator.

a. $\log_4 16 = 2$ $(4^2 = 16)$

b. $\log_5 1 = 0$ $(5^0 = 1)$

c. $\log_3 \frac{1}{9} = -2$ $(3^{-2} = \frac{1}{3^2} = \frac{1}{9})$

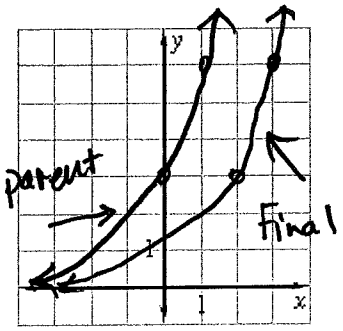
2. Rewrite the equation in exponential form. $\log_4 \frac{1}{64} = -3$

$4^{-3} = \frac{1}{64}$

3. Rewrite the equation in log form. $5^2 = 25$ $\log_5 25 = 2$

Graph the function. State the domain and range. Identify at least two points.

4. $y = 3 \cdot 2^{x-2}$ [2 right]

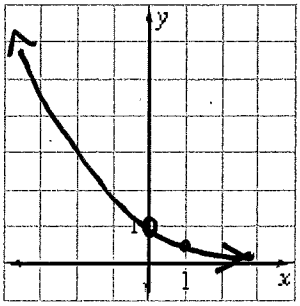


Domain: Real

Range: $y > 0$

Points:
$(0, 3) \rightarrow (2, 3)$
$(1, 6) \rightarrow (3, 6)$

5. $y = (\frac{2}{5})^x$

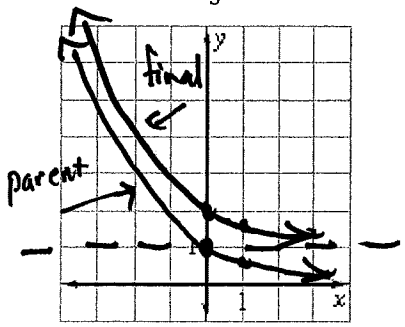


Domain: Real

Range: $y > 0$

Points:
$(0, 1)$
$(1, \frac{2}{5})$

6. $f(x) = (\frac{3}{5})^x + 1$ 1 up



Domain: Real

Range: $y > 1$

Points:
$(0, 1) \rightarrow (0, 2)$
$(1, \frac{3}{5}) \rightarrow (1, 1\frac{3}{5})$

Simplify the expression.

7. $3e^4 \cdot e^3$

$3e^7$

8. $(-4e^{3x})^5$

$(-4)^5 e^{15x}$
or
$-1024 e^{15x}$

9. $\frac{e^{4x}}{5e}$

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

$\frac{1}{5} e^{4x-1}$

10. $\frac{8e^{5x}}{6e^{2x}}$

$\frac{8}{6} \frac{e^{5x}}{e^{2x}}$

$\frac{4}{3} e^{3x}$

11. From 1990 to 2010, the number n (thousands) of people living in Jefferson City be modeled by $n = 45(0.75)^t$ where t is the number of years since 1990.

a. Identify the decay factor: 0.75

b. Identify the percent decrease: 25% $(1 - 0.75 = 0.25 = 25\%)$

c. Estimate the number of people living there in the year 2000. $\rightarrow (t = 10)$

$n = 45(0.75)^{10} = 2.53$ thousand

12. You deposit \$1400 in an account that pays 3% annual interest. Find the balance after 6 years if...

a. The interest is compounded quarterly: $n = 4$ $A = 1400\left(1 + \frac{0.03}{4}\right)^{4 \cdot 6}$ $= \$1674.98$

b. The interest is compounded monthly: $n = 12$ $A = 1400\left(1 + \frac{0.03}{12}\right)^{12 \cdot 6}$ $= \$1675.73$

c. The interest is compounded daily: $n = 365$ $A = 1400\left(1 + \frac{0.03}{365}\right)^{365 \cdot 6}$ $= \$1676.09$

d. The interest is compounded continuously:

$A = Pe^{rt} = 1400e^{(0.03)(6)} = \$1676.10$

11. From 1990 to 2010, the number n (thousands) of people living in Springfield be modeled by $n = 10(1.15)^t$ where t is the number of years since 1990.

a. Identify the growth factor: 1.15

b. Identify the percent increase: 15% $(1.15 - 1 = 0.15 = 15\%)$

c. Estimate the number of people living there in the year 2000. $(t = 10)$

$n = 10(1.15)^{10} = 40.46$ thousand