

1. Write the equation in exponential form:

$$\log_b 243 = 5$$

1. \_\_\_\_\_

2. Write the equation in logarithmic form:

$$9^x = 287$$

2. \_\_\_\_\_

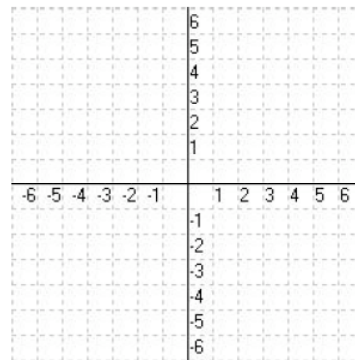
3. Evaluate the expression without using a calculator:

$$\log_5 125$$

3. \_\_\_\_\_

4.. Graph the function:

$$y = \log_3 x$$



5. Find the domain of the logarithmic function:

$$f(x) = \log_6(x + 5)$$

5. \_\_\_\_\_

6. Use the formula  $R = \log\left(\frac{a}{T}\right) + B$  to find the intensity R on the Richter scale, given that amplitude a is 346 micrometers, time T between waves is 2 seconds and B is 2.2. Round your answer to one decimal place.

6. \_\_\_\_\_

7. The formula  $y = 1 + 1.6 \ln(x+1)$  models the average number of free-throws a basketball player can make consecutively during practice as a function of time, where  $x$  is the number of consecutive days the basketball player has practiced for two hours. After 78 days of practice, what is the average number of consecutive free throws the basketball player makes?

7. \_\_\_\_\_

### 14.5 part 1

Solve the exponential equation by expressing each side as a power of the same base and then equating exponents.

8.  $5^x = 125$

8. \_\_\_\_\_

9.  $3^{(2x+1)} = 27$

9. \_\_\_\_\_

Solve the following logarithmic equations.

10.  $\log_3 x = 4$

10. \_\_\_\_\_

11.  $\log_2(x - 4) = -3$

11. \_\_\_\_\_



7. The formula  $y = 1 + 1.6 \ln(x+1)$  models the average number of free-throws a basketball player can make consecutively during practice as a function of time, where  $x$  is the number of consecutive days the basketball player has practiced for two hours. After 78 days of practice, what is the average number of consecutive free throws the basketball player makes?

$$y = 1 + 1.6 \ln(78+1) \quad 7. \underline{8 \text{ free throws}}$$

$$1 + 1.6 \ln(79) = 7.99 \approx 8$$

## 14.5 part 1

Solve the exponential equation by expressing each side as a power of the same base and then equating exponents.

8.  $5^x = 125$   
 $5^x = 5^3$   
 $x = 3$

8.  $x = 3$

9.  $3^{(2x+1)} = 27$   
 $3^{2x+1} = 3^3$   
 $2x+1 = 3$   
 $2x = 2$   
 $x = 1$

9.  $x = 1$

Solve the following logarithmic equations.

10.  $\log_3 x = 4$   
 $3^4 = x$   
 $81 = x$

10.  $x = 81$

11.  $\log_2(x-4) = -3$

$$2^{-3} = x-4$$

$$\frac{1}{8} = x-4$$

$$4 + \frac{1}{8} = x$$

$$4\frac{1}{8} = x$$

11.  $x = 4\frac{1}{8}$