## Name \_\_\_\_\_\_ 5.3 Practice

## Determine whether the given function is exponential or not. For those that are exponential functions, write the function.



## 3. (#33-40)

Problems 33-40, the graph of an exponential function is given. Match each graph to one of the following functions.



## Use transformations to graph each function. Determine the domain, range, and horizontal asymptote of each function.

4.  $f(x) = -3^{x} + 1$  5.  $f(x) = 1 - 2^{-\frac{x}{3}}$  6.  $f(x) = e^{x} - 1$  7.  $f(x) = 7 - 3e^{2x}$ 

Solve each equation.

8. 
$$4^{x^2} = 2^x$$
  
9.  $8^{x^2 - 2x} = \frac{1}{2}$   
10.  $\left(\frac{1}{5}\right)^{2-x} = 25$   
11.  $4^x - 2^x = 0$ 

12.  $(e^4)^x e^{x^2} = e^{12}$ 

$$2^{x} = 3$$
, what does 4<sup>-x</sup> equal?

 $5^{-x} = 3$ , what does  $5^{3x}$  equal?

**Determine the exponential function whose graph is given.** 15. 16.







18.



19. Between 5:00 pm and 6:00 pm, cars arrive at Jiffy Lube at the rate of 9 cars per hour (0.15 car per minute). The following formula from the field of probability can be used to determine the probability that a car will arrive within *t* minutes of 5:00 pm:

$$F(t) = 1 - e^{-0.15}$$

- a) Determine the probability that a car will arrive within 15 minutes of 5:00 pm.
- b) Determine the probability that a car will arrive within 30 minutes of 5:00 pm.
- c) What value does *F* approach as *t* becomes unbounded in the positive direction?

20. People enter a line for the *Demon Roller Coaster* at the rate of 4 per minute. The following formula from probability can be used to determine the probability that *x* people will arrive within the next minute.

$$P(x) = \frac{4^x e^{-4}}{x!}$$

where

$$x! = x \bullet (x-1) \bullet (x-2) \bullet \dots \bullet 3 \bullet 2 \bullet 1$$
  
example : 5! = 5 • 4 • 3 • 2 • 1

- a) Determine the probability that 5 people will arrive within the next minute.
- b) Determine the probability that 8 people will arrive within the next minute.

21. A model for the number of people *N* in a college community who have heard a certain rumor is  $N = P(1 - e^{-0.15d})$ 

where *P* is the total population of the community and *d* is the number of days that have elapsed since the rumor began.

In a community of 1000 students, how many students will have heard the rumor after 3 days?