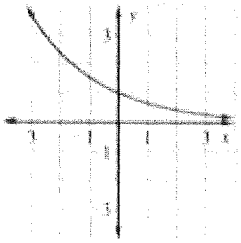
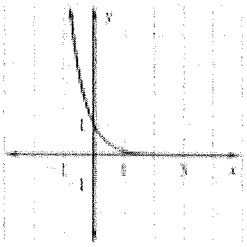
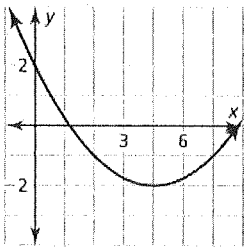
Name: _____ Period: ____

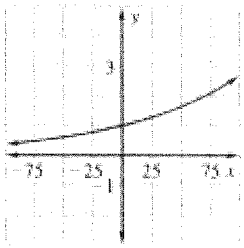
6.4 Exponential DECAY Worksheet

State whether the graph shows exponential growth, exponential decay or neither.

1. 

2. 

3. 

4. 

State whether the equation shows exponential growth or exponential decay. Explain how you know.

5. $y = 3.4(^1/_5)^x$

6. $y = (1.234)^x$

7. $y = 5(0.47)^x$

8. $y = 0.11(^8/_3)^x$

For the decay models shown, identify the initial amount, decay factor, and *percent* decay rate.

9. $y = 6(0.98)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

10. $y = 7.4(0.23)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

11. $y = (0.2)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

12. $y = 4(0.003)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

13. $y = (0.999)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

14. $y = 13(^1/_2)t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

15. $y = {}^2/_3(0.702)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

16. $y = 9(0.0501)^t$

Initial Amount: _____

Decay Factor: _____

Decay Rate: _____

17. **You buy a used car for $12,000. It depreciates at a rate of 15% per year. If this trend continues…**

a. Write an exponential decay function that models the profit in dollars over time.

b. What is the value of the car after 1 year?

c. What is the value of the car after 5 years?

18. **Business A had 4000 employees in 2001. Each year the number of employees has decreased by 2.1%.**

a. Write an exponential decay function that models the employment of Business **A** over time.

b. How many employees will Business A have in 2017?

19. **The table shows declining employment for Business B over time where t is number of years since 2005.**

t	0	1	2	3
Employees	7000	6300	5670	5103

a. What is the initial amount?

b. What is the decay factor?

c. What is the decay rate?

d. Write an exponential decay function that models the employment of Business **B** over time.

20. **Use the information from questions 18–19 to answer the following:**

a. Which business will have more employees in 2017?

b. How many more employees will that business have than the other in 2017?

(Worked–Out Solutions Online!)

ANSWERS:

1. Decay
2. Decay
3. Neither
4. Growth
5. Decay
6. Growth
7. Decay
8. Growth
9. initial amt: 6
   decay factor: 0.98
   decay rate: 2%
10. initial amt: 7.4
    decay factor: 0.23
    decay rate: 77%
11. initial amt: 1
    decay factor: 0.2
    decay rate: 80%
12. initial amt: 4
    decay factor: 0.003
    decay rate: 99.7%
13. initial amt: 1
    decay factor: 0.999
    decay rate: 0.1%
14. initial amt: 13
    decay factor: ½ or 0.5
    decay rate: 50%
15. initial amt: $^2/_3$
    decay factor: 0.702
    decay rate: 29.8%
16. initial amt: 9
    decay factor: 0.050
    decay rate: 94.99%
17. a. $y = 12{,}000(0.85)^t$
    b. $10,200
    c. $5,324.46
18. a. $y = 4{,}000(0.979)^t$
    b. 2,848 employees
19. initial amt: 7,000 employees
    decay factor: 0.9
    decay rate: 10%
    $y = 7{,}000(0.9)^t$
20. a. Business A will have more employees in 2017
    b. 871 more employees