Name: _____

**1.**

A used car was purchased in July 2000 for $11,900. If the car depreciates 13% of its value each year, what is the value of the car, to the *nearest hundred dollars*, in July 2003?

Answer: $ [_____]

- - - - - - - - - - - - -

**2.**

The Franklins inherited $3,500, which they want to invest for their child's future college expenses. If they invest it at 8.25% with interest compounded monthly, determine the value of the account, in dollars and cents, after 5 years. Use the formula $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$, where $A$ = value of the investment after $t$ years, $P$ = principal invested, $r$ = annual interest rate, and $n$ = number of times compounded per year.

Answer: $A = $ [_____]

- - - - - - - - - - - - -

**29.**

The formula for interest compounded annually (once a year) is $A = P(1 + r)^t$, where $A$ is the amount of money in the account after '$t$' years have passed, $P$ is the amount of money that the account started with (the principal), and '$r$' is the annual rate of interest, expressed as a decimal. What is the amount of interest earned, to the nearest cent, if a principal sum of $250 is invested at 6% interest compounded annually for a period of 7 years?

Answer: $A = $ [_____]

**3.**

Growth of a certain strain of bacteria is modeled by the equation

$G = A(2.7)^{0.584t}$, where:

- $G$ = final number of bacteria
- $A$ = initial number of bacteria
- $t$ = time (in hours)

In approximately how many hours will 4 bacteria first increase to 2,500 bacteria? Round your answer to the *nearest hour*.

Answer: [_____] hours

- - - - - - - - - - - - -

**4.**

The strength of a medication over time is represented by the equation $y = 200(1.5)^{-x}$, where $x$ represents the number of hours since the medication was taken and $y$ represents the number of micrograms per millimeter left in the blood. Which graph best represents this relationship?



1.

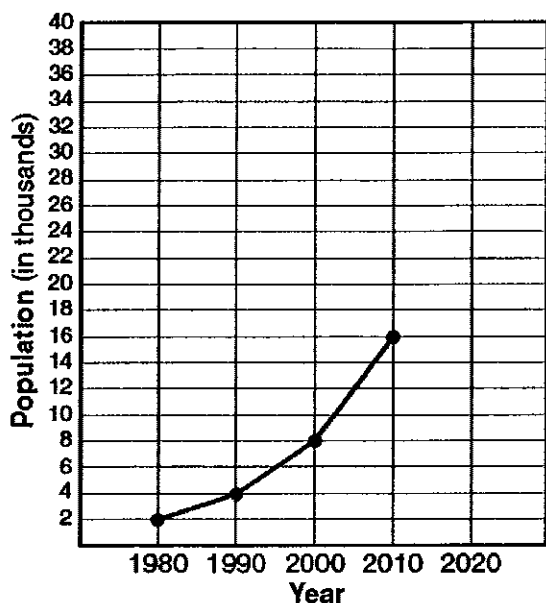2.

3.
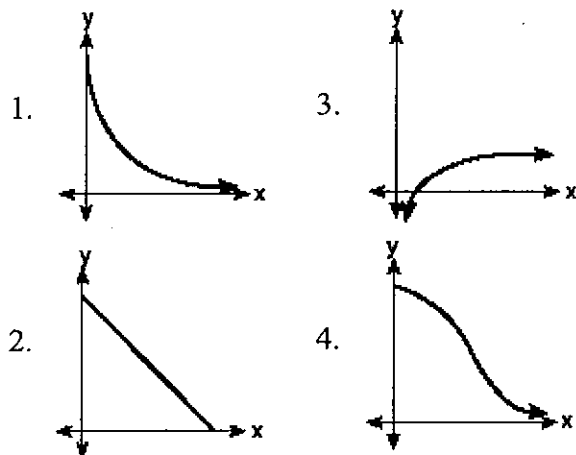
4.

- - - - - - - - - - - - -

5.

The population of Henderson City was 3,381,000 in 2003, and is growing at an annual rate of 1.8%. If this growth rate continues, what will the approximate population of Henderson City be in the year 2009?

1. 3,696,000      3. 3,798,000

2. 3,763,000      4. 3,831,000

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6.

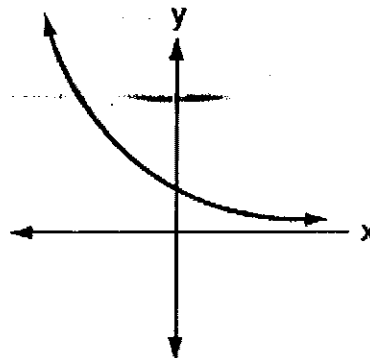The population growth of Boomtown is shown in the accompanying graph.



If the same pattern of population growth continues, what will the population of Boomtown be in the year 2020?

1. 20,000      3. 40,000

2. 32,000      4. 64,000

--------------

7.

Which equation best represents the accompanying graph?



1. $y = 2^x$
2. $y = x^2 + 2$
3. $y = 2^{-x}$
4. $y = -2^x$

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8.

Since January 1980, the population of the city of Brownville has grown according to the mathematical model $y = 720,500(1.022)^x$, where $x$ is the number of years since January 1980.

Which statement about this mathematical model is true?

1. 720,500 represents the population in 1980, while the 1.022 represents a growth rate of 22% added to the current population.
2. 720,500 represents the population in 1980, while 1.022 represents a growth rate of .22% added to the current population.
3. 720,500 represents the population in 1980, while 1.022 represents a growth rate of 2.2% added to the current population.
4. 720,500 represents the population in 1980, while 1.022 represents a growth rate of .022% added to the current population.

The exponential function $f(x) = 15,000(1.02)^x$ models the amount of money in a savings account over a period of time. What does the value 15,000 represent?

1. amount remaining in the account
2. original amount in the account
3. rate of growth
4. time

9.

The population of a small town has been gradually decreasing over the past number of years. The equation: $A = 1236(.97)^t$, where $t$ is time in years, models the decrease in the town's population.

## Figure 1

What was the initial population of the town according to the equation model?

Answer: ☐

- - - - - - - - - - - - -

10.

## [Refer to figure 1 in question 9]

By what percent is the population decreasing yearly?

Answer: ☐%

- - - - - - - - - - - - -

11.

Use the formula: $A = Pe^{rt}$, where '$e$' = 2.718, to model the decay of radioactive material. A certain radioactive material decays at a rate of 1.2% daily. At the end of one week, there were 110.333 grams of radioactive material left in a sample. How many grams were there at the beginning of the week? Round your answer to the *nearest whole number*.

Answer: ☐ grams

- - - - - - - - - - - - -

12.

Matt places $1,200 in an investment account earning an annual rate of 6.5%, compounded continuously. Using the formula $V = Pe^{rt}$, where $V$ is the value of the account in $t$ years, $P$ is the principal initially invested, $e$ is the base of a natural logarithm, and $r$ is the rate of interest, determine the amount of money, to the *nearest cent*, that Matt will have in the account after 10 years.

Answer: $ ☐

- - - - - - - - - - - - -

13.

Mitchell purchased a car in 2008 for $25,980. The function $y = 25,980(0.88)^t$ represents the depreciated value of the car after $t$ years since 2008. What is the approximate value of the car in 2012?

1. $91,450     3. $15,387
2. $15,580     4. $5,387

- - - - - - - - - - - - -

14.

Ten years ago, Jimmy purchased a computer from Techtronics, Inc. for $1,600. The rate of depreciation is 13%. Which function could be used to estimate the value of the computer during this period?

1. $C = 1600(1.13)^t$
2. $C = 13(0.84)^t$
3. $C = 1600(0.87)^t$
4. $C = 1600(0.987)^t$

- - - - - - - - - - - - -

15.

What is the $y$-intercept of $y = -2(2.522)^x - 6$?

1. −8     3. −2.522
2. −6     4. −2

- - - - - - - - - - - - -

16.

Dwayne purchased a computer from Techtronics, Inc. for $2,600 in 2007. The rate of depreciation is 7%. Which would be the best estimate for the value of the computer in 2010?

1. $1,945     3. $2,577

2. $2,091     4. $2,593

- - - - - - - - - - - - -

17.

The equation $h(x) = 20,000(1.12)^x$ represents the number of season ticket holders for the Carolina Panthers since 1995, where $x$ represents the years since 1995 and $h(x)$ represents the number of season ticket holders. In what year were there 50,000 season ticket holders?

1. 2000     3. 2005

2. 2003     4. 2010

- - - - - - - - - - - - -

18.

The growth of the Carolina Hurricanes season ticket holders is modeled by the equation $H = 15,000(1.14)^x$, where $x$ is the number of years and $H$ is the number of season ticket holders. What is the annual rate of growth of the season ticket holders?

1. 0.14%     3. 14%

2. 1.4%     4. 114%

- - - - - - - - - - - - -

19.

Paul deposited $500 into an account paying 8% compounded annually, where $t = 0$ represents the year 2001. Find the first year that his account has at least $1,200.

1. 2002     3. 2010

2. 2005     4. 2012

- - - - - - - - - - - - -

20.

The population of Bridgeville, PA, is 5,300 with a growth rate of 1.3% per year. Which expression could be used to estimate the population of Bridgeville $t$ years from now?

1. $1.3(5300)^t$

2. $5300(1.3)^t$

3. $5300(1.013)^t$

4. $5300t^{1.3}$

- - - - - - - - - - - - -

21.

Jim purchased a Harley Davidson motorcycle for $17,399 in 2004. The value of the motorcycle depreciates at a rate of 13% each year. Which equation models the value of the motorcycle $x$ years after 2004?

1. $M(x) = 17,399(13)^x$

2. $M(x) = 17,399(1.13)^x$

3. $M(x) = 17,399(0.87x)$

4. $M(x) = 17,399(0.87)^x$

- - - - - - - - - - -

Which exponential equation models the data from the table below?

| -2 | 0 | 2 |
|----|---|---|
| 1 | 4 | 16 |

1. $y = 4(2)^x$

2. $y = 2(4)^x$

3. $y = 8(2)^x$

4. $y = -4(2)^x$

## Answer Key for Review Exponential (Retake 01)

| | | |
|---|---|---|
| 1. 7800 | 17. 2 | 33. 6.25 |
| 2. 5279.61 | 18. 3 | 34. 33719.15 |
| 3. 11 | 19. 4 | 35. 3 |
| 4. 1 | 20. 3 | 36. 2 |
| 5. 2 | 21. 4 | 37. 3 |
| 6. 2 | 22. 1 | 38. 83756 |
| 7. 3 | 23. 2 | 39. 2, 3 |
| 8. 3 | 24. 1 | 40. 4, 2 |
| 9. 1236 | 25. 1 | 41. 2, 0.5 or 1/2 |
| 10. 3 | 26. 1 | 42. 1.5 or 3/2, 4 |
| 11. 120 | 27. 3 | 43. 3, 0.25 or 1/4 |
| 12. 2,298.65 | 28. 1954.67 | 44. 2010 |
| 13. 2 | 29. 125.91 | 45. 1 |
| 14. 3 | 30. 2 | 46. 9.99 |
| 15. 1 | 31. 2.5 | |
| 16. 2 | 32. 2400 | |

29. ←
125.91

bottom
2 ←