Name: Date: Period:

1. Which equation models the data in the accompanying table?

Time in Hours, x	0	1	2	3	4	5	6
Population, y	5	10	20	40	80	160	320

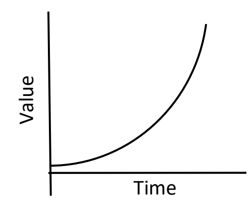
[a] $y = 2x$ [b] $y = 2^x$ [c] $y = 5(2^x)$ [d] $y = 2x + 5$

2. A population of wolves in a county is represented by the equation $P(t) = 80(0.98)^t$, where t is the number of years since 1998. Predict the number of wolves in the population in the year 2012.

3. The height, f(x), of a super ball after x bounces is represented by $f(x) = 80(0.5)^x$. How many times higher is the second bounce than the third bounce?
   [a] 8 [b] 4 [c] 2 [d] 16

4. The accompanying graph represents the value of a bond over time. Which type of function does this graph best model?

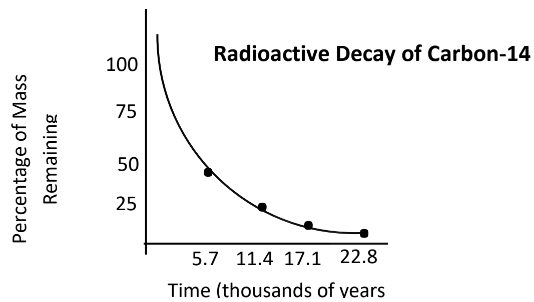
Value of Bond



[a] quadratic [c] exponential

[b] trigonometric [d] logarithmic

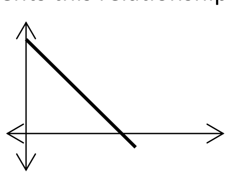
5. Which type of function could be used to model the data shown in the accompanying graph?

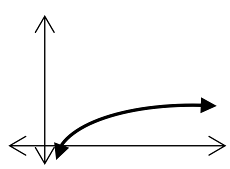


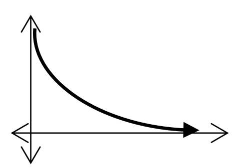
[a] trigonometric [c] logarithmic

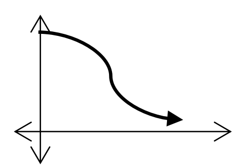
[b] quadratic [d] exponential

6. 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?

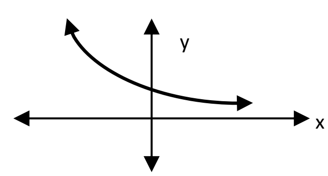
[a]


[b]


[c]


[d]


7. Which equation best represents the accompanying graph?



[a] $y = 2^x$ [b] $y = 2^{-x}$ [c] $y = x^2 + 2$ [d] $y = -2^x$

Refresher for the back… Exponential Equations can be written in the form:

y-intercept: Location where the graph of the equation will intersect the y-axis…Initial Value

$$y = a(b^x)$$

Growth Factor: The quantity that is increasing/decreasing at a growing rate

Identify the y-intercept and growth factor for each equation:

1. $y = 25(4^x)$ y-intercept = __________ growth factor = _________	2. $y = 3(17^x)$ y-intercept = __________ growth factor = __________	3. $y = 2(8^x)$ y-intercept = __________ growth factor = _________	4. $y = 6(3^x)$ y-intercept = __________ growth factor = _________

Create the exponential equation from the provided information:

5. y-intercept = 9 growth factor = 11 Equation: _______________	6. y-intercept = 32 growth factor = 4 Equation: _______________	7. y-intercept = 7 growth factor = 8 Equation: _______________	8. y-intercept = 8 growth factor = 7 Equation: _____________

9. What do *x*, *y*, 5 and 2 represent in the equation $y = 5(2^x)$ for the yearly growth of the rabbit population in a farmer's field.

x: ________________________ y: ________________________ 5: ________________________ 2: ________________________

How many rabbits will be in the farmer's field after 3 years?

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10. In the equation, $y = ab^x$, what does the *a* represent?

[a] the exponent [b] the growth factor [c] the linear equation [d] the y-intercept

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11. Identify the growth factor in the following equation: $\mathbf{y = 56(9^x)}$ Growth Factor: ___________

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12. Create an exponential equation using the given information: **Growth Factor = 2** **y-intercept = 7** Equation: ______________

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13. In the bird garden at Monongahela Middle School, Mr. Evans planted several Black-eyed Susans one summer. The next summer he noticed that the flowers had reproduced significantly and were taking up a larger portion of the garden. Mr. Evans and his class wrote the following equation to represent the growth of the Black-eyed Susans over time: $\mathbf{n = 10(3^t)}$

In this equation, n represents the number of flowers after t time in years. Consider the following questions:

a: How many flowers did Mr. Evans and the class plant the first year? _____________

b: What is the growth factor of the Black-eyed Susan flower in the garden? ____________________

c: How many flowers will be in the garden after 5 years? ___________________

d: In how many years will there be 270 flowers in the garden? _________________

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14. What is the value of *y* when *x* = 6 for the given relationship? $\mathbf{y = 2(3^x)}$

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15. What is the value of *m* if *n* = 1,728 in the equation: $\mathbf{n = 8(6^m)}$

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16. A newly discovered microbe has a growth factor of 5 for every hour. If we have a petri dish with 4 of the microbes on it, what would the equation be to represent this scenario?

Let *m* = the number of microbes and *t* = time in hours

[a] $m = 4(5^t)$ [b] $t = 4(5^m)$ [c] $m = 5(4^t)$ [d] $t = 5(4^m)$

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17. How many would we expect to see after 9 hours have passed?

[a] 18 [b] 180 [c] 1,310,720 [d] 7,812,500