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| **What you need to know and be able to do** | **Things to remember** | **Problem** | **Problem** |
|  **Describe Characteristics of Exponential Functions** | * *Interval of Inc/Dec*
* *Domain*
* *Range*
* *Asymptote*
* *B \_\_\_\_ 1*
* *Growth/Decay*
* *X-int*
* *Y-int*
* *End behaviors*
* *Rate of Change*

$$\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$$ | 1.  | Domain:Range:Asymptote:X-int: Y-int:Int. of Increase or DecreaseB \_\_\_\_ 1Growth or DecayEnd Behaviors:Rate of Change from 0 < x < 2 |
| 2.  | Domain:Range:Asymptote:X-int: Y-int:Int. of Increase or DecreaseB \_\_\_\_ 1Growth or DecayEnd Behaviors:Rate of Change from -2 < x < 0 |
| **Identify Transformations of Exponential Functions** | * *Describe the transformations on the parent function y = 2x*
 | 3. $y= -2\left(2\right)^{x-3}$ | 4. $y=\frac{1}{3}\left(2\right)^{x}+8$ |
| * *Write the equation for the function y = 3x with given transformations*
 | 5. Vertically compress by a factor of 1/3, shift left 3, and shift down 8 | 6. Reflect across the x-axis, vertically stretch by a factor 5, and shift up 7  |
| **Graph Exponential Functions** | * *Use -2, -1, 0, 1, 2 for the x-values*
* *Graph the asymptote*
 | 7. $f\left(x\right)=-2\left(\frac{1}{2}\right)^{x}+5$

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| x | f(x) |
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| 8. $g\left(x\right)=\left(3\right)^{x+2}$

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| --- | --- |
| x | f(x) |
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| **Comparing exponential characteristics** | * *Compare y-intercepts*
* *Compare rates of change*
 | ***Use the graphs from Problems 7 and 8*** |
| 9. Which function has a greater rate of change from 0 < x < 2? Why? | 10. Which function has a lower y-intercept? Why? |
| **Solve Exponential Functions** | * *Isolate the base*
* *Create like bases*
 | 11. $7^{x-9}=49^{2x-3}$  | 12. $64^{3x+5}=1024^{x}$ |
| 13. $6^{x-3}+5=41$ | 14. $8^{3x-1}-3<13$ |
| **Create and Use Exponential Functions from word problems and tables** | * *Find your initial value ‘a’ (x = 0)*
* *Calculate your rate ‘b’*
* *If there are percentages, it is either (1 +r) or (1 – r)*
 | 15. The population of Marietta in 2003 was estimated to be 35,000 people with a rate of increase of about 24%. 1. Write an equation to represent the population of Marietta.
2. Use your equation to estimate the population in 2015 to the nearest hundred people.
 | 16. A certain bacteria that is growing on your kitchen counter doubles every 5 minutes. Assuming that there was only 1 bacteria in the beginning, how many bacteria would there be after 2 hours? |
| 17. Chyna invests $300 at a bank that offers a rate of 5% compounded quarterly. 1. Write an equation to model the amount of money in Chyna’s bank account.
2. How much money will Chyna have in 4 years?
 | 18. Caleb bought a new car at a cost of $25,000. The value of the car decreases about 25% every 2 years. 1. How much will his car be worth about 2 years?
2. How much will his car be worth after 10 years?
 |
| 19. Tina and her friends are having a party. The amount of people that know about the party throughout the week is shown in the table below.

|  |  |
| --- | --- |
| Number of Days | Number of People |
| 0 | 6 |
| 1 | 18 |
| 2 | 54 |
| 3 | 162 |

 | 1. Write the equation of the amount of people that know about the party.
2. How many people will know about the party in a week?
 |
| **Create and Use Geometric Sequences** | * *Recursive Rule:*

$$a\_{n}=r\*a\_{n-1}$$* *Explicit/Closed Rule:*

$$a\_{n}=a\_{1}\left(r\right)^{n-1}$$ | 20. Given the sequence below:152, 76, 38, …1. Use the recursive rule to find the 5th term
2. Create the closed formula for the sequence.
3. Use the explicit formula to find the 8h term
 | 21. Given $a\_{1}=-2$ $a\_{n}=2a\_{n-1}$1. Find the first 5 terms of the sequence.
2. Create the explicit formula.
3. Calculate the 8th and 10th terms.
 |
| **Compare Exponential functions in different forms** | * *Find the characteristics of each function in its own form. Use those characteristics to compare*
* *Y-intercepts occur where x = 0*
* *Rate of change requires 2 points to plug into the slope formula*
* *Greater rate of change is the magnitude of the number, not the sign*
 | **F(x) is represented by the graph below****G(x) is represented by the equation**$$G\left(x\right)=1\left(3\right)^{x}$$ | What is the y-intercept of f(x)?What is the y-intercept of g(x)?Which function has a lower y-intercept?What is the rate of change of f(x) for 0 ≤ x ≤ 3?What is the rate of change for G(x) for 0 ≤ x ≤ 3?Which function has the greater rate of increase for 0 ≤ x ≤ 3? |