

Unit 2 Test Prep Review Fall 25

1. Using the following exponential function:

$$f(x) = 5(4/5)^x$$

- a. What is the y-intercept (initial value)? _____
- b. Is this a growth or decay exponential? _____
- c. Growth factor? _____
- d. Growth rate? _____
- e. Determine $f(4)$. Round to 3 decimal places. _____

2. A car initially costs \$32,000 and depreciates at a rate of 6% per year.

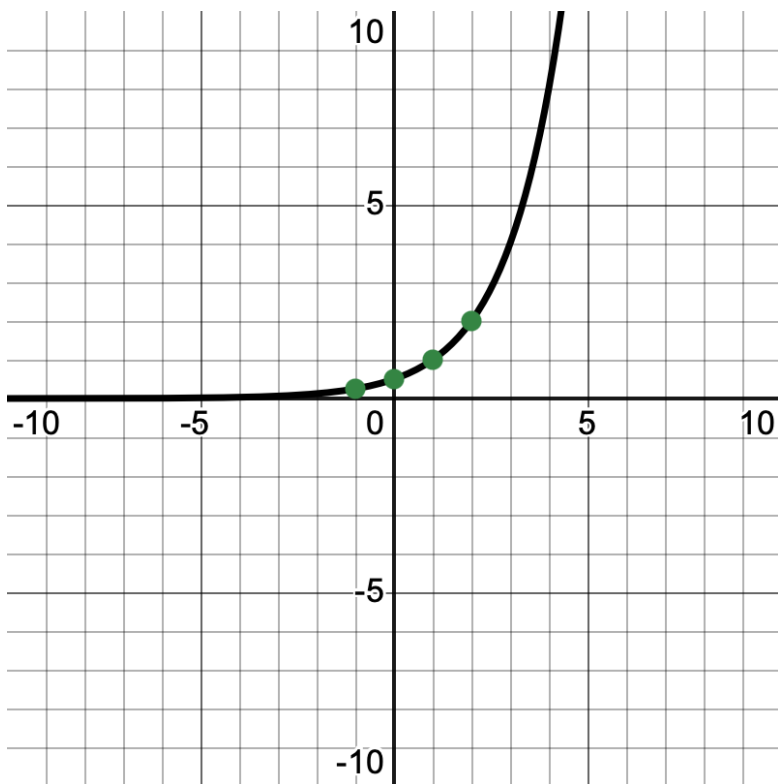
- a. Write an equation for the car's value, $V(t)$, where t is in years.
- b. Rewrite the equation to model the car's monthly depreciation.
- d. Determine the car's value after 3 years.

3. The growth factor for a population over 6 months was 3.6. Determine the monthly growth factor.

4. Write the Exponential model for the table below:

x	-2	0	2	4
f(x)	405	180	80	36

5. Write the formula for the given exponential graph.



6. The table below represents a relationship between x and $h(x)$:

x	-2	-1	0	1	2
h(x)	2.25	3	4	5.33	7.11

a. Is the function linear or exponential? Determine using constant and percent rate of change.

b. Determine the equation that models this table.

7. The table below represents a relationship between x and f(x):

x	-2	-1	0	1	2
f(x)	4	6	8	10	12

a. Is the function linear or exponential? Determine using constant and percent rate of change.

b. Determine the equation that models this table.

8. Using the table below, determine if the data set represents a linear or exponential function.

x	f(x)	Average Rate of Change	Percent Rate of Change
-2	18000		
-1	12000		
0	8000		
1	5333		

9. The population of fish in a pond is modeled by:

$$f(x) = \frac{600}{1 + 5 * 2^{-t}}$$

a. What is the carrying capacity?

b. What was the initial population?

c. Find the population after 4 years.

d. How many years will it take to reach 400 fish?

10. A principal amount of \$800 is invested at an annual interest rate of 4.6%.

a. Find the total amount after 8 years if compounded quarterly.

b. Find the total amount after 8 years if compounded continuously.

11. Rewrite the exponential model $y = 6.2(5/8)^x$ as an equivalent model with base e .

(in the form $y = Ce^{rx}$). Round r to 3 decimal places.

12. Expand and simplify: $\log_4 \left(\frac{16x^3\sqrt{y}}{z^2} \right)$

13. Condense and simplify: $3 \ln(x) - 4 \ln(z) + 2 \ln(y) - 5 \ln(w)$

14. A bacteria culture starts with 40 cells and increases at a rate of 35% per hour.

a. Write an exponential model for this growth.

b. Predict the number of bacteria after 6 hours.

15. A dose of 100 mg of a drug is administered to a patient. Each hour, 20% of the drug leaves the body.

a. Write an exponential decay model for the amount remaining after x hours.

b. Predict the amount after 5 hours.

c. Predict when the amount will reach 25 mg.

16. The function $S(x) = 28 + 2.4\log(x + 1)$ models ocean salinity x meters deep.

a. Find the depth where the salinity equals 31.

b. Find the salinity at a depth of 600 meters.