Student: Cole Lamers **Date:** 06/23/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 4.1 Exponential Functions

1. Is the following an exponential function?

   $y = x^4$

   Is $y = x^4$ an exponential function?

   ○   Yes

   ◉ ✔   No

2. Is the following an exponential function?

   $y = x^3$

   Is $y = x^3$ an exponential function?

   ○   Yes

   ◉ ✔   No

3. Given the function $f(x) = 3^{1-x}$, find $f(-2)$.

   $f(-2) = \boxed{ 27 }$

   (Simplify your answer. Type an integer or a fraction.)

4. Find the exponential function of the form $f(x) = c \cdot a^x$ that contains the two points shown below.

   (0,9) and (2,81)

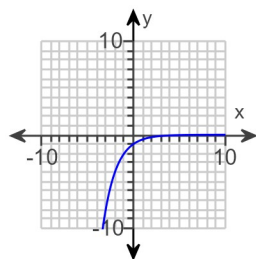 $f(x) = \boxed{ 9 \cdot 3^x }$

5. Watch the video and then solve the problem given below.
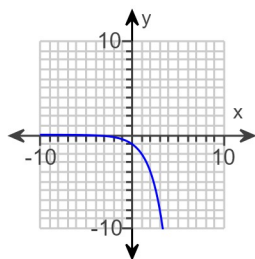
   Click here to watch the video.[1]

   Graph the exponential function $f(x) = 2^x$.

   Choose the correct graph below.
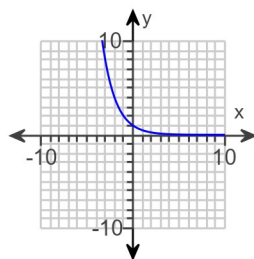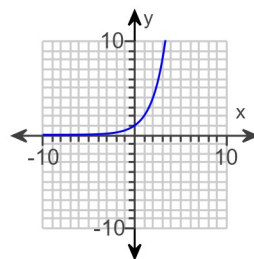
   ○ **A.**   ○ **B.**   ○ **C.**   ◉ ✔ **D.**

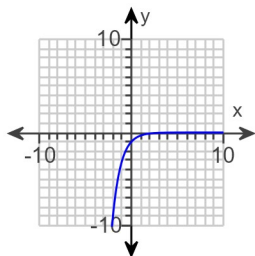   1: http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQlmQjePp7wZ6QEIxgO

6. Watch the video and then solve the problem given below.
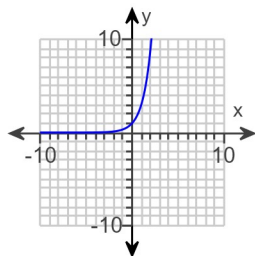
   Click here to watch the video.[2]

   Graph the exponential function $f(x) = \left(\dfrac{1}{3}\right)^x$.
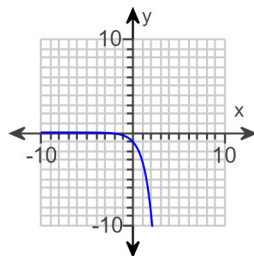
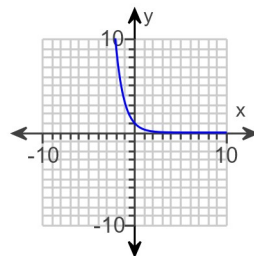   Choose the correct graph below.

   ○ **A.**   ○ **B.**   ○ **C.**   ✔ **D.**

   2: http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQlmQjePp7wZ6QEIxgO

7.
   Graph the function.

   $f(x) = \left(\dfrac{1}{3}\right)^x$

   Choose the correct graph.
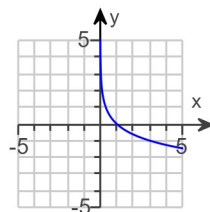
   ○ **A.**   ○ **B.**
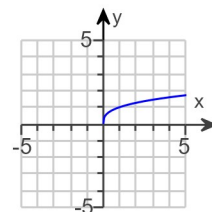
   ○ **C.**   ✔ **D.**

---

8. Write an equation of the graph in the final position.

   The graph of $y = 2^x$ is shifted 4 units to the left and then 6 units up.

   Which of the following is the equation of the graph?

   ○ **A.** $y = 2^{x-4} - 6$

   ○ **B.** $y = 2^{x-4} + 6$

   ✔ **C.** $y = 2^{x+4} + 6$

   ○ **D.** $y = 2^{x+4} - 6$

9. Using the formula for simple interest and the given values, find I.

    P = $2,452; r = 10%; t = 6 months; I = ?

    I = $ ____122.6____   (Round to two decimal places.)
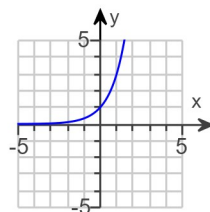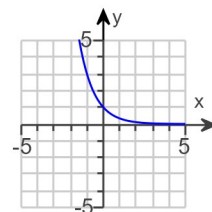
10. Watch the video and then solve the problem given below.

    Click here to watch the video.[3]

    Mykala has deposited $5,000 in a bank for 6 years at a simple interest rate of 5%. How much money will she receive at the end of the six years?

    Mykala will receive $ ____6500____ .

    3: http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQlmQjePp7wZ6QEIxgO

11. Watch the video and then solve the problem given below.

    Click here to watch the video.[4]

    Mykala has deposited $5,000 in a bank for 6 years at the interest rate of 5% compounded annually. How much money will she receive at the end of the six years?

    Mykala will receive $ ____6700____ . (Round to the nearest dollar as needed.)

    4: http://mediaplayer.pearsoncmg.com/assets/IViKVvCZjrwsqAQlmQjePp7wZ6QEIxgO

12. Find **(a)** the future value of the given principal P and **(b)** the interest earned in the given period.

    P = $3400 at 7.5% compounded annually for 16 years

    (a) The future value of the principal after 16 years is $ ____10814.7____ .
    (Round to the nearest cent as needed.)

    (**b**) The interest earned in 16 years is $ ____7414.7____ .
    (Round to the nearest cent as needed.)

13. Find the principal P that will generate the given future value A, where A = $12,000 at 9% compounded daily for 10 years.

    The principal P will be approximately $ ____4879.38____ . (Round to two decimal places as needed.)

14. Watch the video and then solve the problem given below.

    Click here to watch the video.[5]

    The number of bacteria at the beginning of an experiment was 30 and the bacteria grow at an hourly rate of 1.4 percent. Using the model given by $A(t) = A_0\, e^{kt}$, estimate the number of bacteria, rounded to the nearest whole number, after 20 hours.

    After 20 hours, the number of bacteria is about ____40____ .
    (Round to the nearest whole number as needed.)

    5: http://mediaplayer.pearsoncmg.com/assets/xOzFUOJNwYiYr3uANkIX7yYvLqEZN0g6?clip=3

15. Suppose a metal block is cooling so that its temperature T (in $°C$) is given by $T = 200 \cdot 4^{-0.3t} + 25$, where t is in hours.

     a. Find the temperature after **(i)** 2 hours, **(ii)** 2.5 hours.
     b. How long has the cooling been taking place if the block now has a temperature of $125°C$?
     c. Find the eventual temperature $(t \to \infty)$.

     a. (i) After 2 hours the temperature will be about   112.1 $°C$.
     (Simplify your answer. Do not round until the final answer. Then round to the nearest tenth as needed.)

     (ii) After 2.5 hours the temperature will be about   95.7 $°C$.
     (Simplify your answer. Do not round until the final answer. Then round to the nearest tenth as needed.)

     b. The cooling has been taking place about   2   hours.
     (Simplify your answer. Do not round until the final answer. Then round to the nearest integer as needed.)

     c. The eventual temperature is   25 $°C$.
     (Simplify your answer.)

16. The population (in thousands) of people of a city is growing according to the function $P(t) = 1100(2)^{0.1045t}$, where t is the number of years since 1998.
     (a) Find the population of the city in 1998 and in 2005.
     (b) Predict the population in 2013.
     (c) When will the population reach 8.8 million?

     (a) The population (in thousands) of the city in 1998 is   1100   and in 2005 is   1826   .
     (Round to the nearest whole number as needed.)

     (b) The predicted population (in thousands) in 2013 is   3260   .
     (Round to the nearest whole number as needed.)

     (c) In the year   2027   the population will reach 8.8 million.
     (Round to the nearest whole number as needed.)

17. Evaluate the expression.

     5^0

     $5^0 =$ 1
     (Simplify your answer. Type an integer or a decimal.)

18. Evaluate.

     $\left(\dfrac{2}{5}\right)^{-2}$ $\left(\dfrac{2}{5}\right)^{-2} =$ $\dfrac{25}{4}$