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|  |  | Don't forget | Rd Cobetada <br> st page! Unit 10 Test Tues 4/21 | 6.1 <br> Stamp |
| :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & 10 \\ & \frac{10}{0} \\ & \frac{1}{2} \end{aligned}$ | 4/ 13/2015 | Objective: | Equations of Functions <br> Practice \#1-10 |  |
| $\begin{aligned} & 8 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | 4/ 14/2015 | Objective: <br> Assignment: | Interpreting Exponentials <br> Practice \#1-6 |  |
| $\begin{aligned} & \text { त } \\ & \stackrel{0}{4} \\ & \frac{1}{0} \\ & \frac{0}{3} \end{aligned}$ | 4/ 15/2015 | Objective: <br> Assignment: | Applications of Exponentials <br> Practice \#1-5 |  |
| $\begin{aligned} & 8 \\ & \text { io } \\ & 0 \\ & \frac{10}{2} \\ & 5 \end{aligned}$ | 4/16/2015 | Objective: <br> Assignment: | Direct \& Inverse <br> Variation <br> Practice \#1-8 |  |
| 10 10 10 10 | 4/ 17/2015 | Objective: | Direct \& Inverse <br> Variation <br> 6.1 Due Today |  |

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Be lw $\mathbf{k}$
Week of $\qquad$ - $\qquad$

Monday

Name: $\qquad$
Period: $\qquad$

Friday

## Practice - Equations of Exponential Functions

$\qquad$
$\qquad$ Period $\qquad$

## Write the function rule for each, then use your calculator to answer the questions.

1. 

| $\boldsymbol{x}$ | -2 | -1 | 0 | 1 | 2 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\boldsymbol{y}$ | 5 | 25 | 125 | 625 | 3125 |

Function Rule: $\qquad$
What is the value of $y$ when $x$ is -3 ?

What is the value of $x$ when $y$ is 390,625 ?
2.

| $\boldsymbol{x}$ | -3 | -2 | -1 | 0 | 1 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\boldsymbol{y}$ | 32 | 16 | 8 | 4 | 2 |

Function Rule: $\qquad$
What is the value of $y$ when $x$ is 5 ?

What is the value of $x$ when $y$ is 16,384 ?
3.

| $x$ | -2 | -1 | 0 | 1 | 2 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $y$ | $\frac{1}{81}$ | $\frac{1}{27}$ | $\frac{1}{9}$ | $\frac{1}{3}$ | 1 |

Function Rule: $\qquad$
What is the value of $y$ when $x$ is 6 ?

What is the value of $x$ when $y$ is 6561?
4. Use the data in the table to describe how the ladybug population is changing. Write a function that models the data. Use your function to predict the ladybug population after one year.

| Ladybug Population |  |
| :---: | :---: |
| Time (mo) | Ladybugs |
| 0 | 10 |
| 1 | 30 |
| 2 | 90 |
| 3 | 270 |

How data is changing:

Function rule: $\qquad$
Number of lady bugs after one year: $\qquad$
5. Which function is an example of exponential decay?

A $\quad y=-5\left(\frac{1}{3}\right)^{x}$
B $y=5(3)^{x}$
C $y=5\left(\frac{1}{3}\right)^{x}$
D $y=\left(\frac{1}{2}\right) \cdot 3^{x}$
6. Which function best models the data $\{(-4,-2),(-2,-1),(0,0),(2,1),(4,2)\} ?$

A $y=\left(\frac{1}{2}\right)^{x}$
B $y=\frac{1}{2} x$
C $y=\frac{1}{2} x^{2}$
D $y=\left(\frac{1}{2} x\right)^{2}$

Algebra I - Unit 10: Topic 1 - Equations of Exponential Functions

## Use the data from each problem below to calculate an equation of best fit, then use the equation to answer the questions.

7. The table shows the number of computers in a school for four years. Write a function to model the data. Use your function to predict how many computers the school will have in 2006 if the pattern continues.

| Number of Computers |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Year | ‘00 | ‘01 | ‘02 | ‘03 |
| Computers | 14 | 28 | 56 | 112 |

Function Rule: $\qquad$
Prediction of computers in 2006: $\qquad$
8. What type of function does the data $\{(-6,17),(-7,20),(-8,23),(-9,26)$ represent?
9. The chart below shows the ticket sales for movies on a certain screen at one theater over four days.

| Day | \# Tickets |
| :---: | :---: |
| 1 | 3000 |
| 2 | 2400 |
| 3 | 1920 |
| 4 | 1536 |

Function rule: $\qquad$
How many tickets were sold on Day 8? $\qquad$

Algebra I - Unit 10: Topic 1 - Interpreting Graphs of Exponential Functions

## Practice - Interpreting Graphs of Exponential Functions pp 772-795 Name <br> $\qquad$ Date <br> $\qquad$ <br> $\qquad$

1. The graph below shows how a certain bacteria can grow at an alarming rate when each bacteria splits into two new cells, thus doubling.
A. What was the increase between Day 8 and Day 9 ?
B. After 7 days, what is the approximate number of bacteria?
C. After about how many days was there 800 bacteria?

2. Cellular phone usage has grown about $22 \%$ each year since 1995 .
A. If the $y$-intercept is 34 (million), what does this mean?
B. In what year were there approximately 60 million cellular phone users?

3. The graph below shows the relationship of the value of Myka's car over a period of years. According to the graph, which of the following statements appears to be true?
A. The value of the car decreased by almost $\$ 1000$ each year.
B. The value of the car decreased by $\$ 500$ each year.
C. The value of the car decreased more from year 13 to year 15 than in any other year.
D. The value of the car decreased more from year 0 to year 1 than in any other year.

4. Which statement best describes the graph shown to the right?
A. The amount of money in John's savings when he deposits $\$ 35$ each month.
B. The amount of money in an account that triples every month.
C. The amount of money in Kara's checking account when she writes $\$ 50$ in checks each month.
D. The amount of money Michael owes on his car as he makes car payments.

5. Rearrange the functions below into three related groups. Explain why you grouped the functions together. What made each function fit the characteristics of their group?
$f(x)=-3^{x}$
$f(x)=4$
$f(x)=\left(\frac{1}{2}\right)^{x}$
$f(x)=\frac{1}{2} x^{2}$
$f(x)=2 x^{2}+5$
$f(x)=-3 x^{2}$
$f(x)=8-\frac{1}{2} x$
$f(x)=2^{x}$
$f(x)=2 x-5$

6. Identify the following graphs as linear, exponential, or quadratic.

a. $\qquad$
b. $\qquad$ c. $\qquad$

Algebra I - Unit 10: Topic 1 - Applications of Non-Linear, Non-Quadratic Functions
Practice - Applications of Non-Linear, Non-Quadratic Functions
pp 781-788
Name $\qquad$ Date $\qquad$ Pd. $\qquad$

1. In 2009, a large company decides to build a manufacturing plant in the town of Tiny, Texas with 1400 residents. Due to the increase in jobs available with this company, the population of Tiny, Texas increase $9 \%$ each year. This growth is represented by the equation $y=1400 \bullet(1.09)^{x}$
A. Approximately when would the population of Tiny, Texas double?
B. A new fast food restaurant is considering a franchise in Tiny, Texas. Based on market research, it is a better financial investment when the town has a population of at least 4000. If the growth of Tiny, Texas continues, in what year should the fast food restaurant open in this town?
2. The MSRP price of a 2011 Cadillac Escalade is $\$ 63,160$. The vehicle depreciates in value by $8 \%$ each year. This depreciation is represented by the equation $y=63160 \bullet(0.92)^{x}$.
A. What is its value 6 years after it is purchased?
B. Will the car ever have a value of zero dollars?
3. The population fish in a pond is decreasing at a rate of $1 \%$ per year. In 2000 , there were 1300 fish in this pond. This decay can be represented by the equation $y=1300 \mathrm{~g}(0.99)^{x}$
A. What is the population of fish in 2008 ?
B. Between which two years will the population of fish be half of what it was in 2000 ?
4. Annual sales for a small childrens' clothing company are $\$ 149,000$ and increase at a rate of $6 \%$ per year. This growth is represented by the equation $y=149,000 \bullet(1.06)^{x}$.
A. Explain why the base of the exponent 1.06 .
B. When applying for a small business loan, the company must report a 10 year business model. In ten years, what are their projections for annual sales?
5. In 2002, the student enrollment in a local high school was 970 students and increases by $1.2 \%$ per year. This growth is represented by the equation $y=970 \bullet(1.012)^{x}$.
A. When student enrollment reaches 1200, the district must consider plans for building a new high school. When will the district begin making these plans?
B. The 1000th student to enroll will receive a free graphing calculator as a prize. In which year is this projected to occur?

## Practice - Direct and Inverse Variation

Name $\qquad$

1. The number of calories in a container of milk is directly proportional to the amount of milk in the container. If there are 160 calories in an 8 ounce glass of milk, find the number of calories in a 15 ounce glass of milk.
2. The cost per person to rent a mountain cabin is inversely proportional to the number of people who share the rent. If the cost is $\$ 26$ per person when five people share the rent, how much would each person spend if 8 people share the rent?
3. The table below demonstrates a relationship of inverse variation. Complete the table with the appropriate values.

| $\boldsymbol{x}$ | $\boldsymbol{y}$ |
| :---: | :---: |
|  | 1.0 |
| 4.0 |  |
| 2.0 | 3.0 |
|  | 12 |

What is $k$ for this relationship of inverse variation? Explain your reasoning.
4. A marching band can make various rectangular patterns with differing numbers of rows and columns. The number of columns is inversely proportional to the number of rows for a band of fixed size. Suppose that the RHS band can form a rectangle with 12 rows and 9 columns. How many columns would there need to be if there were six rows?

Date $\qquad$

Per $\qquad$
5. Which of the following equations shows a relationship in which $y$ is inversely proportional to $x$ ?
I. $(x+1) y=\frac{1}{2}$
II. $y=0.625 x$
III. $y=\frac{x+5}{3}$
A. II only
B. II and III only
C. I only
D. Neither I, II or III
E. I, II and III
6. The number of kilograms of water in a person's body varies directly as the person's mass. A person with a mass of 90 kg contains 60 kg of water. How many kilograms of water are in a person whose mass is 50 kg ?
7. The current in an electric circuit varies inversely as the amount of resistance in the circuit. The current is 10 amps when the resistance is 24 ohms. Find the current when the resistance is 30 ohm.
8. The formula for finding electrical current is $I=\frac{V}{R}$ Where $V$ represents voltage and $R$ represents resistance. Fill in the blanks below.

Electrical current, /, varies $\qquad$ with voltage, V.

Resistance, $R$, varies $\qquad$ with electrical current, $/$.
$\qquad$ Date $\qquad$
$\qquad$

## Test Preparation Practice

## Algebra 1

A.10.A Solve quadratic equations using concrete models, tables, graphs, and algebraic methods.

Solve each problem. Choose the best answer for each question and record your answer on the Student Answer Sheet. Figures are not drawn to scale

1. The height, $h$, of a baseball thrown upward with an initial velocity of 10 feet per second from 6 feet above the ground is modeled by the function, $h=-16 x^{2}+10 x+6$, where $x$ is the time in seconds. How long does it take before the ball hits the ground?
A 0.375 second
B 0.5 second
C 1.0 second
D 1.375 seconds
2. Each side of a square is decreased by 6 inches. The area of the resulting square is 50 square inches. What is the length of one side of the original square? Round your answer to the nearest hundredth.
F 1.07 in.
G 2.14 in.
H 13.07 in.
J 26.14 in .
3. Which of the following shows members of the solution set for the equation $y=x^{2}-10 x-39 ?$
A $(-3,0)$ and $(13,0)$
B $(3,0)$ and $(-13,0)$
C $(10,0)$ and $(39,0)$
D ( $-10,0$ ) and $(-13,0)$
4. Which quadratic equation can be used to find the length of the unknown side of the triangle?
2.9 ft


F $x^{2}+2.9=6$
G $x^{2}-8.41=36$
H $x^{2}+8.41=36$
J $x^{2}+44.41=0$
5. As part of a marketing plan, the local radio station drops a box of dollar bills from the roof of a 225 -foot tall building. The height, $h$, of the box of money as it drops, is modeled by the function, $h=-16 t^{2}+225$, where $t$ is the time in seconds after the box is released. In how many seconds will the box reach the ground?
A 1.25 seconds
B 3.75 seconds
C 14.0625 seconds
D 16 seconds
6. Two numbers have a sum of 5 . What is the greater number if the product of the two numbers is -24 ?

F -3
G -1
H 8
J 12
$\qquad$ Date $\qquad$ Class $\qquad$
7. Which graph can be used to solve the quadratic equation, $y=x^{2}+2 x-13$ ?

A


B


C


D

8. A golf ball is struck from ground level, and its height, $h$, in feet above the ground is modeled by the function, $h(t)=-16 t^{2}+200 t$, where $t$ represents the time in seconds after the ball is hit. How long is the ball in the air?
F 0 second
G 12.5 seconds
H 16 seconds
J 200 seconds
9. Which ordered pairs in the table correspond to the roots of the quadratic equation $y=2 x^{2}-5 x-12$ ?

| $x$ | $y$ |
| :---: | :---: |
| -4 | 40 |
| -2.5 | 13 |
| -2 | 6 |
| -1.5 | 0 |
| -1 | -5 |
| 0 | -12 |
| 2.5 | -12 |
| 3.5 | -5 |
| 4 | 0 |

A All of them
B ( $-1.5,0$ ) and ( $0,-12$ )
C $(4,0)$ and $(0,-12)$
D ( $-1.5,0$ ) and (4, 0)
10. Which equivalent equation can be used to solve $-4+20 x-25 x^{2}=0$ ?
F $-1(2-5 x)^{2}=0$
G $-1(2+5 x)^{2}=0$
H $(2-5 x)(2+5 x)=0$
J $-1(2-5 x)(2+5 x)=0$
11. The trees in a rectangular orchard are arranged in parallel rows that form a rectangular region. The number of trees in each row of the orchard is 24 less than the number of rows. How many trees are in each row if there are 11,520 trees in the orchard?

A 120 trees
B 96 trees
C 72 trees
D 24 trees

