**NUTS & BOLTS - ALGEBRA 1**

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| **UNIT 8** |
| * The standard form for a quadratic is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * The vertex form for a quadratic is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * To change a quadratic from standard form to vertex form, you use   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   * The formula for the **AXIS OF SYMMETRY** is: * When you solve a quadratic, the solutions are called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or   the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. To find the zeros, replace *f(x)* with \_\_\_\_\_\_\_\_\_\_\_\_\_\_!   * To solve a quadratic-linear system of equations algebraically, set the   equations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

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| **UNIT 9** |
| * The standard form of an exponential is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * In the equation, *a* represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, *b* represents   the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and *x* represents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   * If the exponential is increasing, it represents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * If the exponential is decreasing, it represents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * The rate of change for an exponential will have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

**COMMON CORE EXAM QUESTIONS**

1. In the function , the minimum value occurs when *x* is

(1) -2 (2) 2 (3) -4 (4) 4

2. Which quadratic function has the largest maximum?



3. The height of a rocket, at selected times, is shown in the table below.



Based on these data, which statement is *not* a valid conclusion?

(1) The rocket was launched from a height of 180 feet.

(2) The maximum height of the rocket occurred 3 seconds after launch.

(3) The rocket was in the air approximately 6 seconds before hitting the ground.

(4) The rocket was above 300 feet for approximately 2 seconds.

4. Which function has zeros of and ?



5. The function  can be written in vertex form as

(1)  (3) 

(2)  (4) 

6. A landscaper is creating a rectangular flower bed such that the width is half of the length. The area of the flower bed is 34 square feet. Write and solve an equation to determine the width of the flower bed, to the *nearest tenth of a foot*.

7. New Clarendon Park is undergoing renovations to its gardens. One garden that was originally a square is being adjusted so that one side is doubled in length, while the other side is decreased by 3 meters.

The new rectangular garden will have an area that is 25% more than the original square garden. Write an equation that could be used to determine the length of a side of the original square garden.

Explain how your equation models the situation.

Determine the area, in square meters, of the new rectangular garden.

8. A rectangular picture measures 6 inches by 8 inches. Simon wants to build a wooden frame for the picture so that the framed picture takes up a maximum area of 100 square inches on his wall. The pieces of wood that he uses to build the frame all have the same width.

Write an equation or inequality that could be used to determine the maximum width of the pieces of wood for the frame Simon could create.

Explain how your equation or inequality models the situation.

Solve the equation or inequality to determine the maximum width of the pieces of wood used for the frame to the *nearest tenth of an inch*.

9. The range of the function defined as  is

(1)  (3) 

(2)  (4) 

10. Dylan invested $600 in a savings account at a 1.6% annual interest rate. He made no deposits or withdrawals on the account for 2 years. The interest was compounded annually. Find, to the *nearest cent*, the balance in the account after 2 years.

11. Milton has his money invested in a stock portfolio. The value, , of his portfolio can be modeled with the function , where *x* is the number of years since he made his investment. Which statement describes the rate of change of the value of his portfolio?

(1) It decreases 78% per year.

(2) It decreases 22% per year.

(3) It increases 78% per year.

(4) It increases 22% per year.

12. The 2014 winner of the Boston Marathon runs as many as 120 miles per week. During the last few weeks of his training for an event, his mileage can be modeled by , where *w* represents the number of weeks since training began. Which statement is true about the model ?

(1) The number of miles he runs will increase by 90% each week.

(2) The number of miles he runs will be 10% of the previous week.

(3) represents the total mileage run in a given week.

(4) *w* represents the number of weeks left until his marathon.