**Algebra 1 Final Exam Review Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Determine the factored form of the following quadratic functions.

a. x2 – 14x – 15 b. 3x2 + 12x – 36

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1. Determine the solutions to the following quadratic functions.

 a. 3x2 = 27 b. 2x2 – 3 = –4x

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1. ![[image]]()Use the graph to the right to answer the questions.

a. Determine the vertex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Determine the increasing interval. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Determine the decreasing interval. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Write the quadratic equation of the graph of the parent function, y = x2, that has been shifted down 3 units and stretched by a factor of 2.

y = \_\_\_\_\_\_\_(x – \_\_\_\_\_\_\_)2 + \_\_\_\_\_\_\_\_

**\*\*Remember\*\*\* All shifts from vertex form: y = a(x – h)2 + k**

a: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Vertex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

h: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Axis of Symmetry: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

k: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. **An object is projected into the air with a path described by the function** $h\left(t\right)=-16t^{2}+96t+160$ **where h is the height above the ground in feet and t is the time in seconds since the object started along the path.**

a. Find the time the object changes direction. b. Find the maximum height of the object.

c. Describe the location of the object at 2.5 seconds. d. Describe the location of the object at 4.1 secs.

1. **When a quadratic expression consists of two perfect square terms which are being subtracted, then this quadratic can be factored using the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ method.**
2. **Completing the Square is a method for solving \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
3. **Quadratic functions whose graphs open \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have local minima.**
4. **The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a quadratic function always lies on the axis of symmetry.**

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1. **Write down examples of functions for each of the following:**

a. linear increase b. exponential growth c. linear decrease d. exponential decay

 y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. **For each table, write the best description, then write the appropriate function.**

 a. b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 |
| f(x) | 27 | 9 | 3 | 1 | 1/3 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 |
| f(x) | 3 | 0 | -1 | 0 | 3 |

description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

function: y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function: y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Sketch a graph for each type of function.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. linear increase
 | 1. exponential growth
 | 1. linear decrease
 | 1. exponential decay
 |
| Image result for x-y coordinate plane | Image result for x-y coordinate plane | Image result for x-y coordinate plane | Image result for x-y coordinate plane |

1. **Draw a graph for each description.**

|  |  |  |
| --- | --- | --- |
| 1. even
 | 1. odd
 | 1. neither
 |
| Image result for x-y coordinate plane | Image result for x-y coordinate plane | Image result for x-y coordinate plane |

1. **Write examples of functions for each description.**

|  |  |  |
| --- | --- | --- |
| 1. even
 | 1. odd
 | 1. neither
 |
|  |  |  |

1. **Determine the equation for the following situation:** *Becky began with 4 bugs. She noticed that they increased by a factor of 1.5 every year.*
2. **When comparing linear growth and exponential growth, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ function will always eventually win.**
3. **Sketch an example of each type of function & then identify each characteristic.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Linear:* | *Quadratic:* | *Exponential:* |
| **PICTURE** | ***Increase:******Decrease:*** | ***Opens Up:******Opens Down:*** | ***Growth:******Decay:*** |
| **END BEHAVIOR** | ***Increase:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_***Decrease:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_ | ***Opens Up:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_***Opens Down:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_ | ***Growth:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_***Decay:***As x🡪 –∞, y 🡪 \_\_\_\_\_\_\_\_\_As x🡪 ∞, y 🡪 \_\_\_\_\_\_\_\_\_ |
| **RANGE** | ***Increase:******Decrease:*** | ***Opens Up:******Opens Down:*** | ***Growth:******Decay:*** |
| **Interval of INCREASE/DECREASE** | ***Increase:*****INCREASE:****DECREASE:*****Decrease:*INCREASE:****DECREASE:** | ***Opens Up:*****INCREASE:****DECREASE:*****Opens Down:*INCREASE:****DECREASE:** | ***Growth:*****INCREASE:****DECREASE:*****Decay:*INCREASE:****DECREASE:** |

1. **Use the following data set to calculate the mean, median, and range.**

 8 12 7 15 19 29 15

Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Create a box and whisker plot for the following data.**

 3 3 4 4 4 5 5 7 8 9 9 9 10 11 11

Min: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Q1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Q3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Max: \_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. **Label the following histograms as either more or less variable.**



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1. **Based on the graph on the right, what is your y-value when your x-value is 7.5?**



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1. **Use the histogram to the right to answer**

** the following questions.**

How many people total were surveyed?

How many people read 0 – 7 books?

How many people read more than 11 books?

**Use the frequency table to answer the following questions.**

Find the marginal totals for each category.

How many 25-49 year old chose horror?

What percentage of people are 50+ and chose comedy?

1. **Label the following graphs as positive, negative, strong, weak, perfect, and/or no correlation.**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. **The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a set of data can be found by subtracting the maximum and the minimum.**
2. **Data with a strong positive correlation will have a correlation coefficient close to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ frequencies can be found in the middle of a Two-Way Table.**
4. **A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a number which is multiplied by a variable.**
5. **When using interval notation, open points are indicated by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**