

March 13, 2019, Monday

Algebra 1 Final Exam Review

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

a.  $x^2 - 14x - 15$   
 $(x + 1)(x - 15)$

b.  $3x^2 + 12x - 36$   
 GCF  
 $3(x^2 + 4x - 12)$   
 $3(x - 2)(x + 6)$

	1	-12	
	1	12	
-2	6	-6	
-12	-2	6	

2) Determine the solutions to the following quadratic functions.

a.  $x^2 = 27$   
 $\sqrt{x^2} = \sqrt{27}$   
 $x = \pm 3\sqrt{3}$

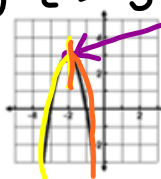
b.  $2x^2 - 3 = -4x$   
 $2x^2 + 4x - 3 = 0$

$a = 2$   
 $b = 4$   
 $c = -3$   

$$\frac{-4 \pm \sqrt{(4)^2 - 4(2)(-3)}}{2(2)} = 0.6, -2.6$$

3) Use the graph to the right to answer the questions.

- a. Determine the vertex.  $(-2, 3)$
- b. Determine the increasing interval.  $(-\infty, -2)$
- c. Determine the decreasing interval.  $(-2, \infty)$



Vertex

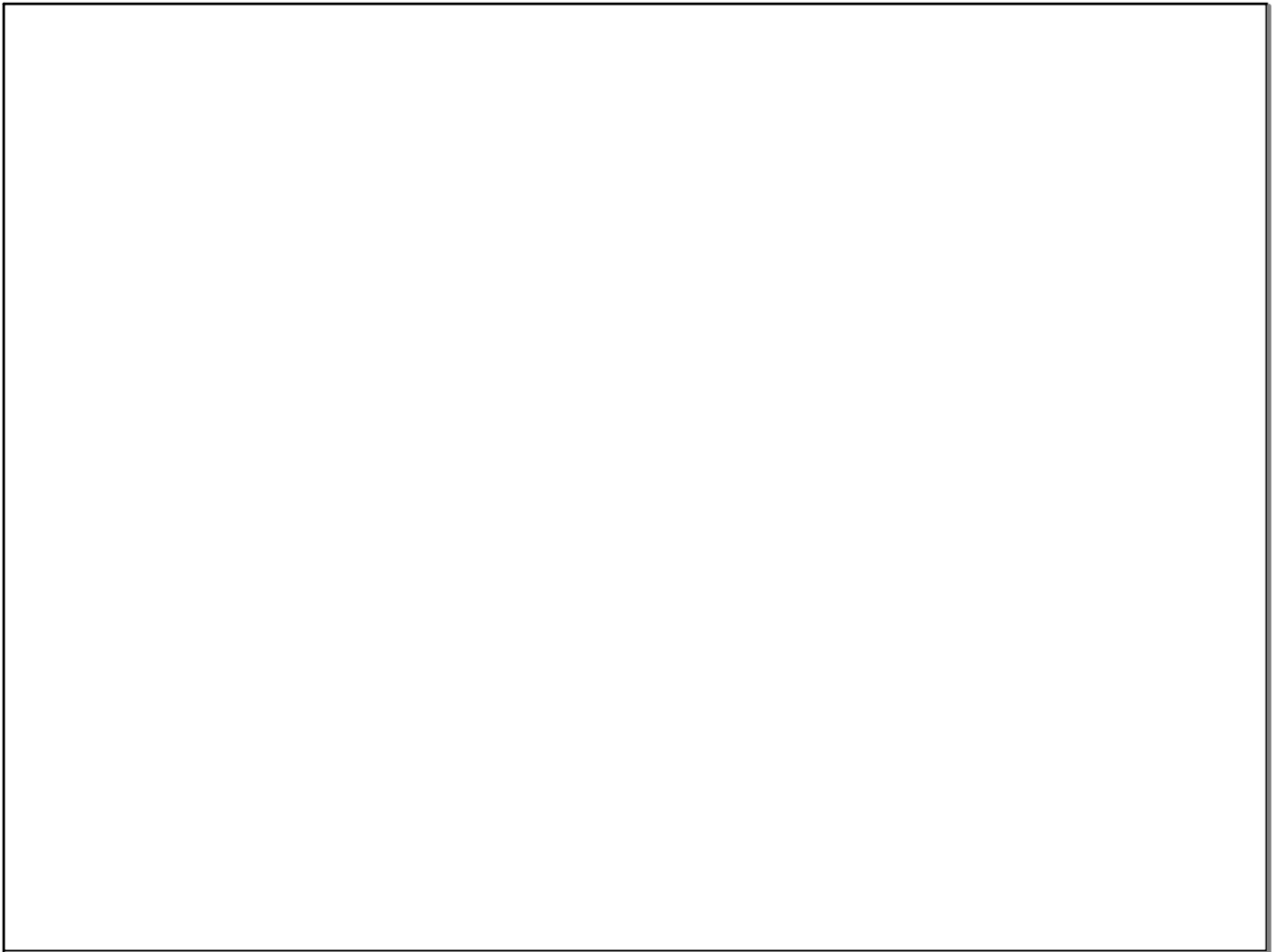
4) Write the quadratic equation of the graph of the parent function,  $y = x^2$ , that has been shifted down 3 units and stretched by a factor of 2.

$y = 2(x - 0)^2 - 3 = 2x^2 - 3$

$a = 2$   
 $b = 0$   
 $c = -3$   
 $x = \frac{-b}{2a} = 0$   
 $y = 2(0)^2 - 3 = -3$

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

a: 2  
 h: 0  
 k: -3  
 Vertex:  $x = \frac{-b}{2a} = 0$   
 Axis of Symmetry:  $x = 0$



<https://www.mathplayground.com/division01.html>

<https://www.multiplication.com/quiz/division-self-correcting-quizzes>

March 14, 2019, Tuesday

5) An object is projected into the air with a path described by the function  $h(t) = -16t^2 + 96t + 160$  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.

6) When a quadratic expression consists of two perfect square terms which are being subtracted, then this quadratic can be factored using the \_\_\_\_\_ method.

7) Completing the Square is a method for solving \_\_\_\_\_.

8) Quadratic functions whose graphs open \_\_\_\_\_ have local minima.

9) The \_\_\_\_\_ of a quadratic function always lies on the axis of symmetry.

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10) 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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<http://www.thegreatmartinicompany.com/Math-Quick-Quiz/division-quiz.html>

Famous Mathematicians selections

March 15, 2019, Wednesday

11) For each table, write the best description, then write the appropriate function.

a.

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

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

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





b.

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




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

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

12) Sketch a graph for each type of function.

<p>a) linear increase</p> 	<p>b) exponential growth</p> 	<p>c) linear decrease</p> 	<p>d) exponential decay</p> 
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13) Draw a graph for each description.

<p>a) even</p> 	<p>b) odd</p> 	<p>c) neither</p> 
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14) Write examples of functions for each description.

<p>a) even</p>	<p>b) odd</p>	<p>c) neither</p>
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Assign Famous Mathematicians

March 16, 2019, Thursday

15) 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.

16) When comparing linear growth and exponential growth, the \_\_\_\_\_ function will always eventually win.

17) Sketch an example of each type of function & then identify each characteristic.

	Linear:	Quadratic:	Exponential:
PICTURE	Increase: Decrease:	<i>Opens Up:</i> <i>Opens Down:</i>	<i>Growth:</i> <i>Decay:</i>
END BEHAVIOR	<i>Increase:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____ <i>Decrease:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____	<i>Opens Up:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____ <i>Opens Down:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____	<i>Growth:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____ <i>Decay:</i> As $x \rightarrow -\infty, y \rightarrow$ _____ As $x \rightarrow \infty, y \rightarrow$ _____
RANGE	<i>Increase:</i> <i>Decrease:</i>	<i>Opens Up:</i> <i>Opens Down:</i>	<i>Growth:</i> <i>Decay:</i>
Interval of Increase/Decrease	<i>Increase:</i> INCREASE: DECREASE: <i>Decrease:</i> INCREASE: DECREASE:	<i>Opens Up:</i> INCREASE: DECREASE: <i>Opens Down:</i> INCREASE: DECREASE:	<i>Growth:</i> INCREASE: DECREASE: <i>Decay:</i> INCREASE: DECREASE:



Display Famous Mathematicians

March 17, 2019, Friday

18) Use the following data set to calculate the mean, median, and range.

8 12 7 15 19 29 15

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

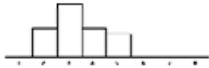
19) Create a box and whisker plot for the following data.

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

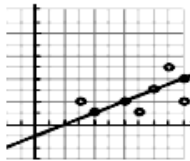
Min: \_\_\_\_\_ Q<sub>1</sub>: \_\_\_\_\_ Median: \_\_\_\_\_ Q<sub>3</sub>: \_\_\_\_\_ Max: \_\_\_\_\_



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



21) Based on the graph on the right, what is your y-value when your x-value is 7.5?

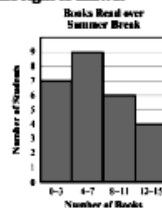


22) Use the histogram to the right to answer the following questions.

How many people total were surveyed?

How many people read 0 - 7 books?

How many people read more than 11 books?



## Amusement Park Project