

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

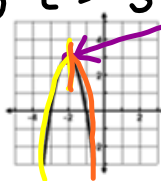
b. $2x^2 - 3 = -4x$
 $2x^2 + 4x - 3 = 0$

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

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

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.

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

Remember

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

a: 2
 h: 0
 k: -3

Vertex: $x = \frac{-b}{2a} = \frac{0}{2(2)} = 0$
 $y = 2(0)^2 - 3 = -3$
 Axis of Symmetry: $x = 0$

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

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

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

May 14, 2019, Tuesday May 15, 2019 Wednesday

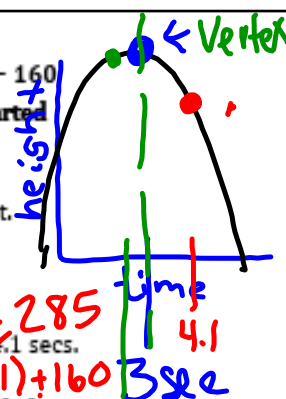
5) An object is projected into the air with a path described by the function $h(t) = -16t^2 + 96t + 160$ where h is the height above the ground in feet and t is the time in seconds since the object started along the path.

a. Find the time the object changes direction.

$t = 3 \text{ sec}$

b. Find the maximum height of the object.

$h = 304 \text{ ft}$



c. Describe the location of the object at 2.5 seconds.

$h(2.5) = -16(2.5)^2 + 96(2.5) + 160 = 300$

d. Describe the location of the object at 4.1 seconds.

$h(4.1) = -16(4.1)^2 + 96(4.1) + 160 = 302$

6) When a quadratic expression consists of two perfect square terms which are being subtracted, then this quadratic can be factored using the Difference of two squares method. $a^2 - b^2 = (a+b)(a-b)$

7) Completing the Square is a method for solving quadratics.

8) Quadratic functions whose graphs open up have local minima.

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

10) Write down examples of functions for each of the following:

a. linear increase

$y = 2x + 3$

b. exponential growth

$y = 2(3)^x$

c. linear decrease

$y = -2x + 3$

d. exponential decay

$y = 2(0.3)^x$

This greater 1

This is less than 1

~~2x+3~~

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

Division Quiz

- | | |
|---------------------------------------|-------------------------|
| 1. $28 \div 4 =$ <input type="text"/> | 11. $77 \div 7 =$ ____ |
| 2. $48 \div 12 =$ ____ | 12. $108 \div 9 =$ ____ |
| 3. $24 \div 6 =$ ____ | 13. $56 \div 7 =$ ____ |
| 4. $48 \div 6 =$ ____ | 14. $32 \div 8 =$ ____ |
| 5. $36 \div 9 =$ ____ | 15. $20 \div 4 =$ ____ |
| 6. $12 \div 6 =$ ____ | 16. $14 \div 2 =$ ____ |
| 7. $90 \div 9 =$ ____ | 17. $66 \div 6 =$ ____ |
| 8. $10 \div 5 =$ ____ | 18. $1 \div 1 =$ ____ |
| 9. $35 \div 5 =$ ____ | 19. $18 \div 6 =$ ____ |
| 10. $40 \div 8 =$ ____ | 20. $27 \div 9 =$ ____ |

Famous Mathematicians selections:

Pick 4 names of mathematics you would be interested in performing research on for the "Famous Mathematicians" project.

Write the numbers 1-4 on your hand out and return to me!

Famous Mathematicians

Brahmagupta	Madhava
Carl Friedrich Gauss	Pierre de Fermat
Charles Babbage	Pythagoras
Diophantus	Rene Descartes
Emmy Noether	Sophie Germain
Euclid	Thales
Fibonacci	Benjamin Banneker
George Boole	Charles Lewis Reason
Gottfried Leibniz	Kelly Miller
Grace Murray Hopper	Dudley Weldon Woodard
Isaac Newton	Martha Euphemia Lofton Haynes
John von Neumann	Elbert Frank Cox
John Wallis	William Waldron Schieffelin
Julia Robinson	Claytor
Leonhard Euler	Marjorie Lee Browne
Luca Pacioli	David Harold Blackwell

1) Select your top four name you are interested in learning more about.

2) I will (hopefully) choose one of your four to assign to you, so we can learn as about as many mathematicians as possible.

May 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

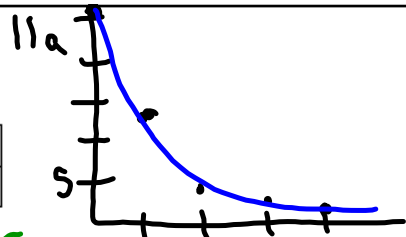
$b = \frac{9}{27}$

a exponential decay
function: $y = 27 \cdot (\frac{1}{3})^x$

b.

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

b quadratic
function: $y = (x-1)(x-3)$
 $y = x^2 - 3x - 1x + 3$
 $y = x^2 - 4x + 3$



12) Sketch a graph for each type of function.

a) linear increase 	b) exponential growth 	c) linear decrease 	d) exponential decay
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v-axis symmetry → rotational symmetry

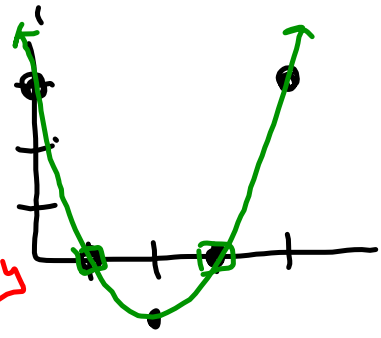
13) Draw a graph for each description.

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

a) even $y = 4x^2 + 1$ $y = 4x^2 + 1$	b) odd $y = x^3 + 4x$ $y = x^3 + 4x$	c) neither $y = 4x^2 + 1 + x^3 + 4x$
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11b



Assign Famous Mathematicians

3) You will research the name you have been assigned to learn at least the following:

Date of birth

Date of death

Birthplace

Location lived as an adult

Where they died

Picture

Family structure (parents, husband/wife, children, etc.)

What was this person's biggest contribution to the field of mathematics?

What are three interesting facts about this person (not included in the above information).

4) You may present your information in the form of:

PowerPoint Slides, these will have to be printed for display

Word Documents, these will have to be printed for display

Legibly handwritten on large paper or multiple sheets

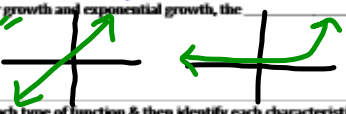
**Your work will be displayed for other to read about your mathematician, so make sure your work is neat.

5) When you have completed you research, see me, so we can find a place on the wall to display your work! Include your name visibly on each page displayed!

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.

$$y = 4(1.5)^x$$

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:	Opens Up: Opens Down:	Growth: Decay:
END BEHAVIOR	Increase: As $x \rightarrow -\infty, y \rightarrow -\infty$ As $x \rightarrow \infty, y \rightarrow \infty$ Decrease: As $x \rightarrow -\infty, y \rightarrow \infty$ As $x \rightarrow \infty, y \rightarrow -\infty$	Opens Up: As $x \rightarrow -\infty, y \rightarrow \infty$ As $x \rightarrow \infty, y \rightarrow \infty$ Opens Down: As $x \rightarrow -\infty, y \rightarrow -\infty$ As $x \rightarrow \infty, y \rightarrow -\infty$	Growth: As $x \rightarrow -\infty, y \rightarrow \infty$ ASYMPTOTE As $x \rightarrow \infty, y \rightarrow \infty$ Decay: As $x \rightarrow -\infty, y \rightarrow \infty$ As $x \rightarrow \infty, y \rightarrow \infty$ ASYMPTOTE
RANGE	Increase: \mathbb{R} Decrease: \mathbb{R}	Opens Up: $[\text{Min}, \infty)$ Opens Down: $(-\infty, \text{Max}]$	Growth: (ASYM, ∞) Decay: (ASYM, ∞)
Interval of INCREASE/DECREASE	INCREASE: $(-\infty, \infty)$ DECREASE: N/A INCREASE: N/A DECREASE: $(-\infty, \infty)$	INCREASE: (min, ∞) DECREASE: $(-\infty, \text{min})$ INCREASE: $(-\infty, \text{max})$ DECREASE: (max, ∞)	INCREASE: $(-\infty, \infty)$ DECREASE: N/A INCREASE: N/A DECREASE: $(-\infty, \infty)$

May 16, 2019, Thursday

I will be signing exemption forms Monday! Know your grade and absences. You can view these in Infinite Campus!!

Display Famous Mathematicians

May 17, 2019, Friday

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

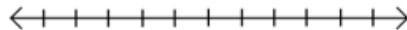
8 12 7 15 19 29 15

Mean: _____ Median: _____ Range: _____

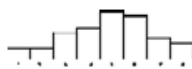
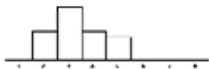
19) Create a box and whisker plot for the following data.

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

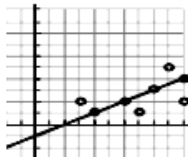
Min: _____ Q₁: _____ Median: _____ Q₃: _____ Max: _____



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?

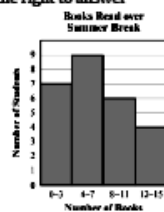


22) Use the histogram to the right to answer the following questions.

How many people total were surveyed?

How many people read 0 - 7 books?

How many people read more than 11 books?



Amusement Park Project

