Final Exam Study Guide

Algebra 1 ~ Final Exam Review

Name _____

1) Determine the factored form of the following quadratic function. $y = x^2 + 11x + 18$

$(x+9)(x+2)$

2) Determine the factored form of the following equation. $y = 6x^2 - 48x + 42$

$6(x^2-8x+7)$
$6(x-7)(x-1)$

3) What is the factored form of $x^2 + 2x - 8$?

$(x+4)(x-2)$

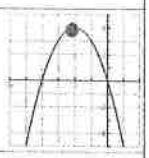
4) Determine the solutions to the following quadratic function. $3x^2 = 45$

$\frac{3}{3}\ \frac{3}{3}$ $x^2 = 15$
$x = \pm\sqrt{15}$

5) Determine the solutions to the following quadratic function. $4x^2 + 5x = 3$

$4x^2+5x-3=0$
$a=4$ $b=5$ $c=-3$
$x_1 = .44$
$x_2 = -1.69$

6) Determine the vertex for the graph below.



$(-2, 4)$

7) Determine the increasing interval for the graph in Question 6.

$(-\infty, -2]$

8) Tell whether the graph of the quadratic function $y = -3x^2 + x + 1$ opens upwards or downward.

down

9) Write the quadratic equation of the graph of the parent function, $y = x^2$, that has been shifted up 5 units and shrunk by a factor of one-fourth.

$\frac{1}{4}x^2 + 5$

10) What is the vertex and axis of symmetry of the quadratic: $y = -4(x+7)^2 - 5$?

Vertex = $(-7, -5)$
Axis of Symmetry = $x =$ -7

11) What is the vertex of $y = x^2 + 8x + 12$?

$x = \frac{-b}{2a}$
$a=1$ $b=8$ $c=12$
$(-4, -4)$
$a=1$ $h=-4$ $k=-4$

12) If $x^2 + 13x + 30 = 0$, what are the possible values of x?

$(x+10)(x+3)$
$x=-10$ $x=-3$

13) Factor the following: $6x^2 - 13x + 5$

$x^2 - 13x + 30$
$(x-10)(x-3)$
$\frac{6}{6}\ \frac{5/3}{6}\ \frac{6}{2}$
$(3x-5)(2x-1)$

14) Liam catapults a rock at 96 ft/s from a height of 15 feet. The height of the rock is modeled by the equation: $h(t) = -16t^2 + 96t + 15$. At what time does the rock reach its maximum height?

$x = \frac{-b}{2a}$
$a=-16$ $b=96$ $c=15$
3 sec.
$a=-16$ $h=3$ $k=159$

15) This function models the height, f(x), in feet, of a ball x seconds after it has been tossed into the air, $f(x) = -16x^2 + 48x + 64$. Which statement describes the ball 1.2 seconds after it is tossed into the air?

$x = \frac{-b}{2a}$

rising

16) Which is the *only* function that might have an *end behavior* such that: As $x \to \infty$, $y \to -\infty$. And as $x \to -\infty$, $y \to \infty$

Linear
~~Quadratic~~

17) Which is the *only* type of function that could have a *range* of $(-3, \infty)$?

exponential

18) Which is the *only* type of function that could have an increasing and a decreasing interval?

quadratic

19) Determine the best description of the equation: $f(x) = -2x + 7$ (using 2 words).

Negative slope
Crossing
y-axis at 7.
Linear Equation

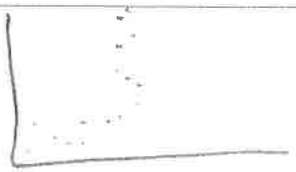
20) Determine the best description of the table (using 2 words):

x	−3	−2	−1	0	1	2
f(x)	8	4	2	1	½	¼

$\frac{1}{2}$

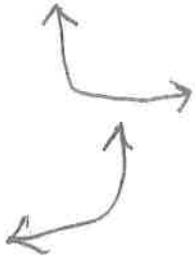
Exponential function

21) Draw an example of a scatter plot that best represents a model of *exponential* growth?



Linear

EXPO



Quad

$y = a(x-h)^2 + k$

$0 = a(1-2)^2 + -1$

$0 = a(-1)^2 - 1$

$0 = 1a - 1$

$+1 \quad +1$

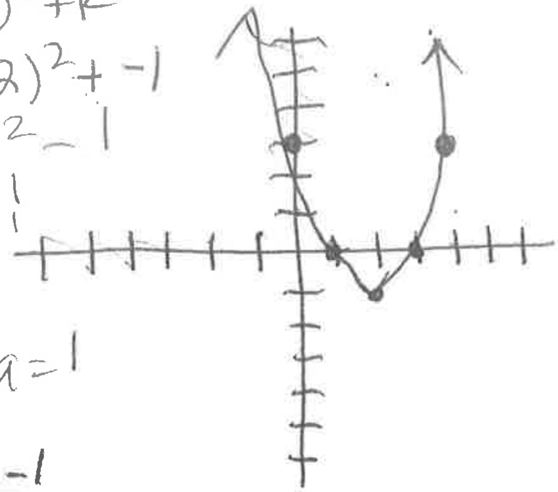
$1 = a1$

$a = 1$

Y-int

Solutions

vertex



22) Determine the equation for the following situation: *Lillian began with 2 wildflowers. She noticed that her flowers tripled every year.*

$y = 2(3)^x$

23) Write the appropriate function that represents the table.

$y = a(x-h)^2 + k$

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

x=1
x=3
(2, -1) vertex
$y = (x-2)^2 - 1$

24) Write an example of a linear function?

$y = 2x + 1$

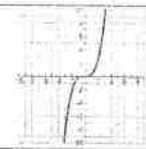
25) Write an example of an exponential function?

$y = 2^x$

26) Write an example of a quadratic function?

$y = x^2 + x + 2$

27) Determine if the graph is even, odd, or neither.



odd

28) Determine if the following function is even, odd, or neither. $f(x) = 3x^2 + 7$

even

29) What is the mean and the median If the following set of numbers?
12, 23, 25, 25, 30, 31, 34, 35, 35, 37, 43

Mean = 30.5 Median = 32.5

30) What is the range of the following data set?
{11, 12, 10, 14, 4, 5}

range = max − min

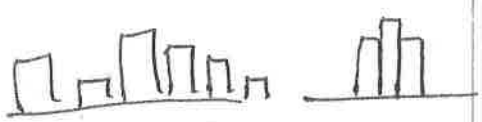
14 − 4 = 10

31) The box and whisker plot represents a data set. Identify the median, maximum, interquartile range, and lower quartile.

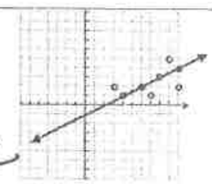
Median: 5.5 Maximum: 8
IQR: 4 Lower Quartile: 3

32) Draw a picture of a data set with more variability and less variability.

More less

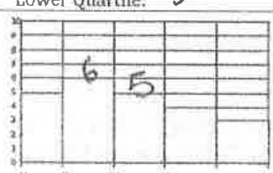


33) Which description most accurately describes the correlation?



Positive

34) The histogram below gives represents ACT scores for randomly selected students. How many students have scores that fall between 15 and 25?



11

Use the frequency table below to answer questions 35 – 36. The following frequency table displays the number of students in a school club.

Participation in School Activities

School Club	Gender		Totals
	Male	Female	
Band	12	21	33
Chorus	15	17	32
Chess	16	3	19
Latin	7	9	16
Yearbook	28	7	35
Totals	78	57	135

35) How many males participate in the yearbook club?

28

36) What is the percentage of students in band?

$\frac{33}{135} = 24\%$ approx.

even functions

reflect y-axis

have even exponents

x^2 3
x^4 4 > all numbers

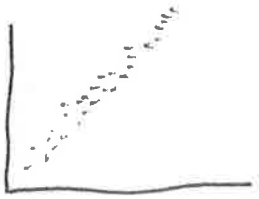
odd functions

rotational symm.

have odd exponents

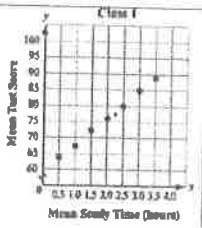
x
x^3

37) Draw an example of a graph that would have an r-value closest to +1.



38) The scatter plot shows the mean study time and the mean test scores for a class. Based on the data, what grade would you expect a student to make who studied for 2.25 hours?

78



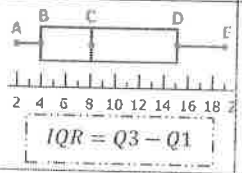
39) Here are the number of text messages students send to each other on a daily basis:
25, 23, 17, 15, 19, 21, 28, 30, 26, 28
What is the median of the data set?

23

one in middle
arranged in order

40) Given the box plot below, what is the interquartile range?

15 - 4 = 11



For Questions #41 – 50, answer using TRUE or FALSE.

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

True

42) Completing the Square is a method for solving linear equations.

False

43) Quadratic functions whose graphs open upward have local minimum.

True

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

True

45) When comparing linear growth and exponential growth, the exponential function will always eventually win.

True

46) The interquartile range of a set of data can be found by subtracting the maximum and the minimum.

False

47) Data with a strong positive correlation will have a correlation coefficient close to negative one.

False

48) Joint frequencies can be found in the middle of a Two-Way Table.

True

49) A constant is a number which is multiplied by a variable.

False

50) When using interval notation, open points are indicated by square brackets.

False

(open — exponential

[closed — quadratic