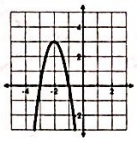
Algebra 1 Final Exam Review Name KEY

1) Determine the factored form of the following quadratic functions.
a. $x^2 - 14x - 15$ $(x-15)(x+1)$ b. $3x^2 + 12x - 36$ $3(x^2+4x-12)=3(x+6)(x-2)$

2) Determine the solutions to the following quadratic functions.
a. $3x^2 = 27$ $x^2=9$ $x=\pm 3$ b. $2x^2 - 3 = -4x$ $2x^2+4x-3=0$ $\frac{-4\pm\sqrt{4^2-4(2)(-3)}}{2(2)}$ $\frac{\pm\sqrt{10}-2}{2}$

3) Use the graph to the right to answer the questions.
a. Determine the vertex. (-2,3)
b. Determine the increasing interval. (-∞, -2)
c. Determine the decreasing interval. (-2, ∞)



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

Remember* All shifts from vertex form: $y = a(x - h)^2 + k$
a: stretch/shrink (-) reflect x-axis Vertex: (h, k)
h: left/right Axis of Symmetry: y=-h
k: up/down

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. $-b/2a = -96/2(-16) = 3$
b. Find the maximum height of the object. $-16(3)^2+96(3)+160 = 304$
c. Describe the location of the object at 2.5 seconds. going up
d. Describe the location of the object at 4.1 secs. going down

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

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 $y = 2x$ b. exponential growth $y = (2)^x$ c. linear decrease $y = -2x$ d. exponential decay $y = (1/2)^x$

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

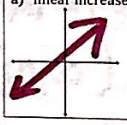
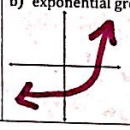
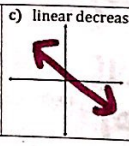
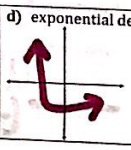
description: exponential
function: $y = 27(1/3)^x$

b.

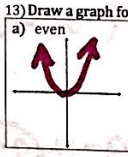
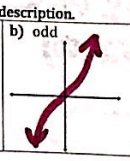
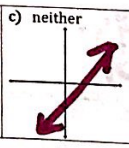
x	0	1	2	3	4
f(x)	3	0	-1	0	3

description: quadratic
function: $y = (x$

12) Sketch a graph for each type of function.

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

13) Draw a graph for each description.

a) even	b) odd	c) neither
		

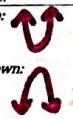
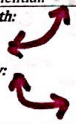
14) Write examples of functions for each description.

a) even	b) odd	c) neither
$y=2$	$y=2x$	$y=2x+6$

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.* $4(1.5)^x$

16) When comparing linear growth and exponential growth, the exponential 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→ −∞, 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 → asymptote As x→ ∞, y → ∞ Decay: As x→ −∞, y → ∞ As x→ ∞, y → asymptote
RANGE	Increase: Decrease: (−∞,∞)	Opens Up: [y-val vertex, ∞) Opens Down: (−∞, y-val vertex]	Growth: (asymptote, ∞) Decay: (−∞, asymptote)
Interval of INCREASE/DECREASE	Increase: INCREASE: always (−∞,∞) Decrease: DECREASE: always (−∞,∞)	Opens Up: INCREASE: (x-val vertex, ∞) DECREASE: (−∞, x-val vertex) Opens Down: INCREASE: (−∞, x-val vertex) DECREASE: (x-val vertex, ∞)	Growth: INCREASE: (−∞,∞) Decay: DECREASE: (−∞,∞)

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

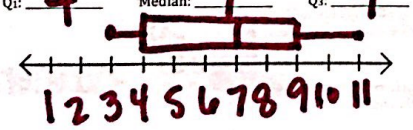
8 12 7 15 19 29 15

Mean: 15 Median: 15 Range: 29 − 7 = 22

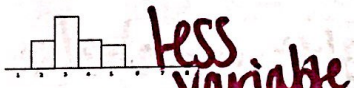
19) Create a box and whisker plot for the following data.

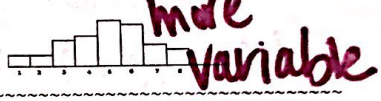
3 3 4 4 4 5 5 7 8 9 9 9 10 11 11

Min: 3 Q1: 4 Median: 7 Q3: 9 Max: 11

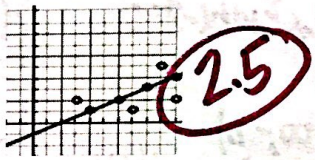


20) Label the following histograms as either more or less variable.

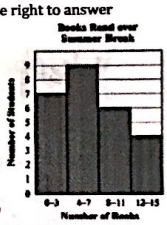




21) Based on the graph on the right, what is your y-value when your x-value is 7.5?



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



How many people total were surveyed? 26

How many people read 0 – 7 books? 16

How many people read more than 11 books? 4

Use the frequency table to answer the following questions.

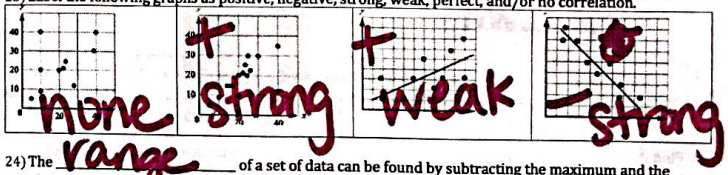
	Action	Comedy	Horror	Total
18-25 years old	238	450	312	1,000
25-49 years old	350	472	178	1,000
50+ years old	320	490	190	1,000
Total	908	1412	680	3000

Find the marginal totals for each category.

How many 25-49 year old chose horror? 178

What percentage of people are 50+ and chose comedy? 0.15 → 15%

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



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

25) Data with a strong positive correlation will have a correlation coefficient close to 1.

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

27) A coefficient is a number which is multiplied by a variable.

28) When using interval notation, open points are indicated by parentheses.