

Alg 1 Support

Hawkins

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Packet #2 - Algebra I -Support

Assignment- Quadratic Equations, Geometric Sequences, Exponential Equations, Growth/Decay, Compound Interest, Half-Life, Statistical Data and Comparing Linear, Quadratic and Exponential Equations

Below you will find a list of the different topics that will be covered over the next two weeks. For this section of time, we are covering Quadratic Equations, Geometric Sequences, Exponential Equations, Growth/Decay, Compound Interest, Half-Life, Statistical Data and Comparing Linear, Quadratic and Exponential Equations

Remember, if you complete all of the work provided to you for the remainder of the school year, it can only improve your grade. While you may be happy with your current average and decide to opt out of doing the work that is being provided to you, it is strongly encouraged that you complete every assignment as it will prepare you for future math courses. Below you will find links to each skill that would have been tested over for Tests 5-11. Please watch the following videos listed below. In Schoology you will see an assignment loaded that is called Quadratic Equations, Geometric Sequences, Exponential Equations, Growth/Decay, Compound Interest, Half-Life, Statistical Data and Comparing Linear, Quadratic and Exponential Equations.

Make sure that you complete either the paper packet (mark your answers on the back of the sheet provided at the end of the packet) or the online portion of this assignment **do BOTH** (Only do either the online assignment or the paper packet, do not do any additional work, your grade will be based on the work you do. You must complete the assignments you are given. You will have an unlimited number of attempts to complete the assignments. Questions are available to answer any and all questions through school email which are listed on the BHS packet.)

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Watch the following videos:

1. Quadratic Equations-
 - a. <https://www.khanacademy.org/math/quadratic-equations/a-quadratic-formula-1>
 - b. <https://www.youtube.com/watch?v=6S2abhszvuQ>
 - c. <https://www.youtube.com/watch?v=evPu1YfQIKw>
2. Geometric Sequences-
 - a. <https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:sequences/x2f8bb11595b61c86:introduction-to-geometric-sequences/v/geometric-sequences-introduction>
 - b. <https://www.youtube.com/watch?v=IGFQXInm-co>
 - c. <https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:sequences/x2f8bb11595b61c86:constructing-geometric-sequences/v/explicit-and-recursive-formulas-for-geometric-sequences>
3. Solving Exponential Equations-
 - a. <https://www.youtube.com/watch?v=-OFC9iRyO1o>
 - b. <https://www.youtube.com/watch?v=6S2abhszvuQ>
 - c. <https://www.youtube.com/watch?v=evPu1YfQIKw>
4. Evaluation Exponential Equations-
 - a. <https://www.youtube.com/watch?v=YTRuOkrxwRk>
 - b. <https://www.youtube.com/watch?v=GQIcZeKR9RI>
5. Exponential Growth and Decay
 - a. <https://www.youtube.com/watch?v=Lj9qNmLRmJ8>
6. Compound Interest
 - a. <https://www.youtube.com/watch?v=U0Lwyh9ONMM>
 - b. <https://www.youtube.com/watch?v=P182Abv3fOk>
7. Half-Life
 - a. <https://www.youtube.com/watch?v=QSUmPTx0k60>
 - b. <https://www.youtube.com/watch?v=GTzvORcnwYE>
 - c. <https://www.youtube.com/watch?v=vY1IMdBXgb4>

<https://www.youtube.com/watch?v=6S2abhszvuQ>

8. Statistical Data-

a. <https://www.youtube.com/watch?v=ZexjdSFaxHI>

b. <https://www.youtube.com/watch?v=PwsXncM2pas>

c.

https://learnzillion.com/lesson_plans/5462-use-two-way-frequency-tables-frequency-count-vs-relative-frequency/

9. Comparing Linear, Quadratic, and Exponential Equations-

a. <https://www.youtube.com/watch?v=9Bu0Hkxw88g>

b. <https://www.youtube.com/watch?v=CxEFOozrMSE>

c. <https://www.youtube.com/watch?v=A4o-69uWK9Y>

Question 1

Solve the equation.

$$x^2 + 10x = 24$$

12, -2

12, 2

-12, 1

-12, 2

Question 2

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

$$4x^2 - 28x + 48$$

prime

$(x - 3)(4x - 16)$

$4(x - 12)(x + 1)$

$4(x - 3)(x - 4)$

Question 3

Consider $h(x) = 3x^2 + 18x + 4$. What is its vertex and y-intercept?

vertex: $(-2, 20)$, y-intercept: -4

vertex: $(-3, -23)$,
y-intercept: -4

vertex: $(-2, -20)$,
y-intercept: 4

vertex: $(-3, -23)$,
y-intercept: 4

Question 4

Find the Vertex.

$$y = x^2 - 3$$

(0,1)

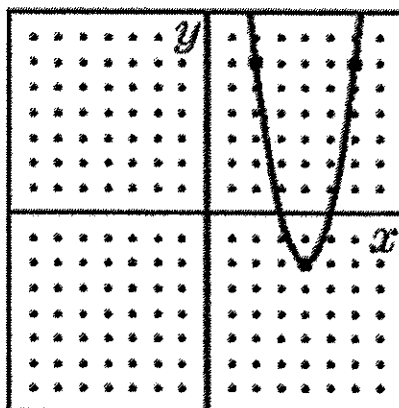
(0,2)

(0,-3)

(0,6)

Question 5

What is the equation of the graph below?



$y = (x - 4)^2 - 2$

$y = 2(x - 4)^2 + 4$

$y = 2(x + 4)^2 - 2$

$y = 2(x - 4)^2 - 2$

Question 6

Use this description to write the quadratic function in vertex form:

The parent function $f(x) = x^2$ is vertically stretched by a factor of 2 and translated 14 units right and 6 units up.

$g(x) = 2(x - 14)^2 + 6$

$g(x) = 2(x + 14)^2 + 6$

$g(x) = \frac{1}{2}(x - 14)^2 + 6$

$g(x) = 2(x - 14)^2 - 6$

Question 7

Write the quadratic equation in vertex form $y = a(x - h)^2 + k$.

$$y = 7x^2 + 28x + 26$$

$y = 7(x + 2)^2 + 2$

$y = -7(x - 2)^2 - 2$

$y = -7(x + 2)^2 + 2$

$y = 7(x + 2)^2 - 2$

Question 8

Determine the domain and the range of the function.

$$f(x) = x^2 + 10x + 25$$

domain: all real numbers

range: $\{y | y \geq 0\}$

domain: $\{x | x \geq -5\}$

range: $\{y | y \geq 0\}$

domain: $\{x | x \geq 5\}$

range: $\{y | y \geq 0\}$

domain: all real numbers

range: $\{y | y \geq 25\}$

Question 9

Solve the equation.

$$8^{4x-1} = 16^{2x}$$

$$\left\{ \frac{4}{3} \right\}$$

$$\left\{ \frac{3}{4} \right\}$$

$$\left\{ \frac{4}{3} \right\}$$

$$\left\{ -\frac{3}{4} \right\}$$

Question 10

Solve the equation.

$$4^{x-2} = 8^{4x}$$

$$\left\{ -\frac{2}{3} \right\}$$

$$\left\{ -\frac{4}{5} \right\}$$

$$\left\{ \frac{1}{5} \right\}$$

$$\left\{ -\frac{2}{5} \right\}$$

Question 11

What are the next three terms of the geometric sequence?

2, 6, 18, ...

- 36, 108, 324
- 54, 162, 486
- 54, 162, -486
- 38, 66, 102

Question 12

What is the explicit formula for the sequence -5, -25, -125...?

- $a_n = 5(-5)^{n-1}$
- $a_n = \frac{1}{5}(-5)^{n-1}$
- $a_n = -5(5)^{n-1}$
- $a_n = -\frac{1}{5}(5)^{n-1}$

Question 13

Write the first *four* terms of the sequence whose general term is given by $t_n = 3(-2)^{n-1}$.

- 3, 6, 12, 24
- 1, -6, 6, -6
- 3, -6, 12, -24
- 0, -6, 12, -24

Question 14

Find the indicated term for the geometric sequence.

-3, -9, -27, -81, . . . ; 10th term

-59,049

531,441

177,147

-19,683

Question 15

A radioactive isotope decays exponentially. The time it takes for half of the amount to decay is called the isotope's half-life. A certain isotope has a half-life of 12 hours. If after 36 hours there are 0.233 mg left, what was the isotope's initial mass?

1.864 mg

954.368 mg

0.052 mg

29.824 mg

Question 16

Which of the following equations represents the amount A in a bank account that pays 1.2% interest compounded annually t years after \$2000 is deposited into the account?

$$A = 2000 + 1.012t$$

$$A = 2000(1.012)^t$$

$$A = 2000 + 1.2t$$

$$A = 2000(1.2)^t$$

Question 17

The population of a town is currently 1500 people and is expected to triple every 4 years. How many people will be living there in 20 years?

- 121,500
- 13,947,137,604
- 30,000
- 364,500

Question 18

A radioactive isotope decays exponentially. The time it takes for half of the amount to decay is called the isotope's half-life. A certain isotope has a half-life of 12 hours. If after 72 hours there are 0.325 mg left, what was the isotope's initial mass?

- 20.8 mg
- 1,331.2 mg
- 5,324.8 mg
- 0.289 mg

Question 19

Answer the question.

What are the domain and range for the equation $y = 2^x$?

- Domain: $(-\infty, \infty)$; range: $(0, \infty)$
- Domain: $(0, \infty)$; range: $(-\infty, \infty)$
- Domain: $(-\infty, \infty)$; range: $(-\infty, \infty)$
- $(-\infty, \infty)$; range: $[0, \infty)$

Question 20

Tell whether the set of ordered pairs satisfies an exponential function. Explain your answer.

$$\{(1, 1), (2, 4), (3, 9), (4, 16)\}$$

Not an exponential function.

As the x -values are increased by a constant amount, the y -values increase by the same amount.

Exponential function.

As the x -values are increased by a constant amount, the y -values are multiplied by a constant amount.

Exponential function.

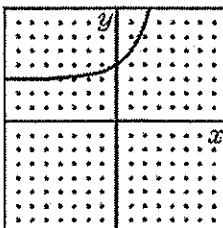
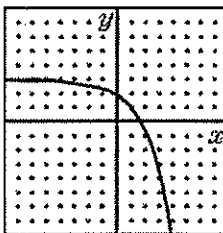
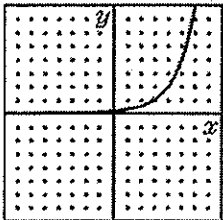
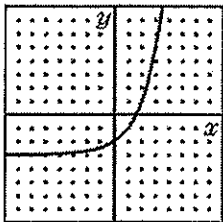
As the x -values are increased by a constant amount, the y -values increase by the same amount.

Not an exponential function.

As the x -values are increased by a constant amount, the y -values are not multiplied by a constant amount.

Question 21

Which one of the following sketches is a reasonable graph of $y = 2^x + 3$?

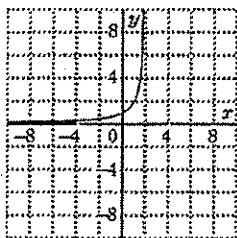


Question 22

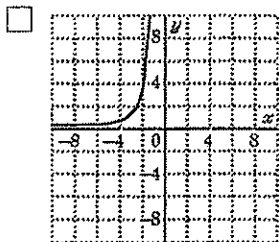
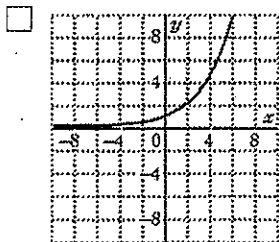
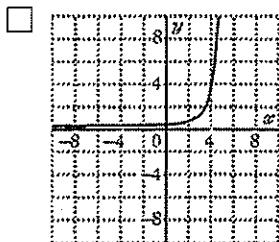
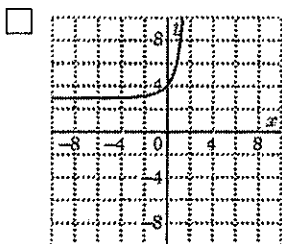
What is the equation of the asymptote of $y = 3^{x-5}$?

- $y = 0$
- $x = 5$
- $x = -5$
- $y = 5$

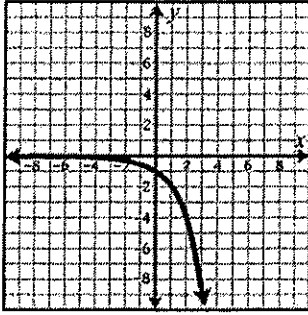
Question 23

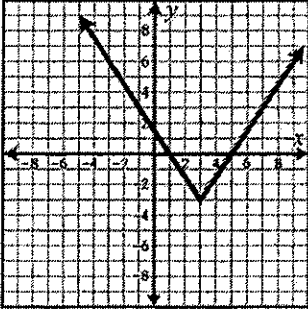


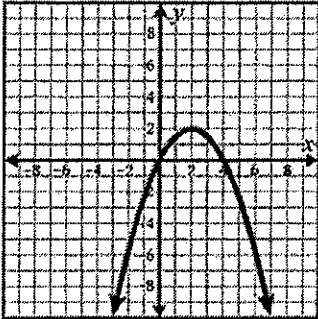
The graph of $y = 4^x$ is given. Which is the graph of $y = 4^{x+3}$?

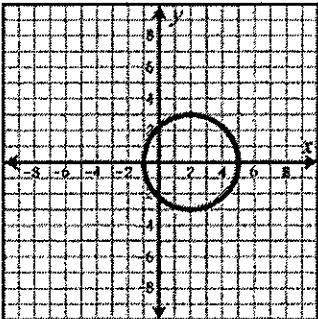


Which of the following sets of data exhibits exponential behavior?





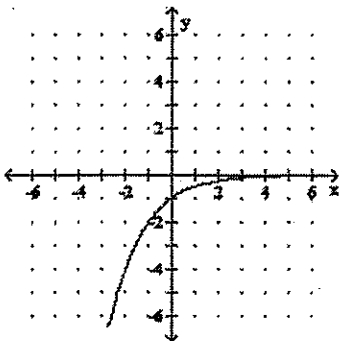
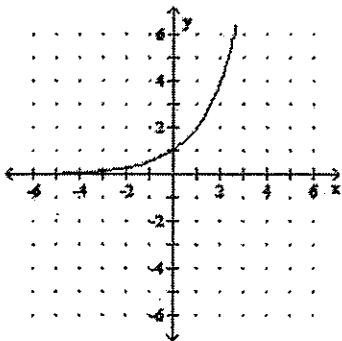
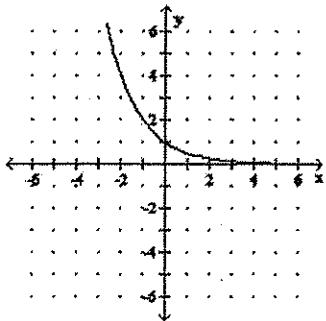
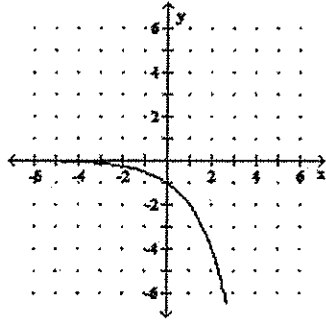
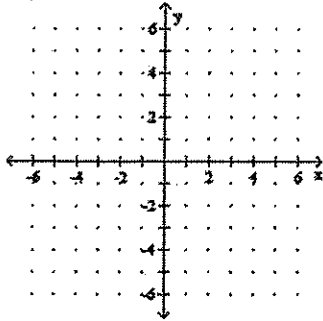




Question 25

Graph the function.

$$f(x) = 2^{-x}$$



Question 26

Evaluate $f(n) = 5^{2n} + 3$. Find $f(1)$

- 8
- 3
- 2
- 28

Question 27

Use this description to write the quadratic function in vertex form:

The parent function $f(x) = x^2$ is vertically stretched by a factor of 2 and translated 14 units right and 6 units up.

- $g(x) = 2(x - 14)^2 + 6$
- $g(x) = 2(x + 14)^2 + 6$
- $g(x) = \frac{1}{2}(x - 14)^2 + 6$
- $g(x) = 2(x - 14)^2 - 6$

Question 28

Which is the average rate of change over the interval $[0, 4]$?

Equation A

X	0	2	4	6
Y	0	4	16	36

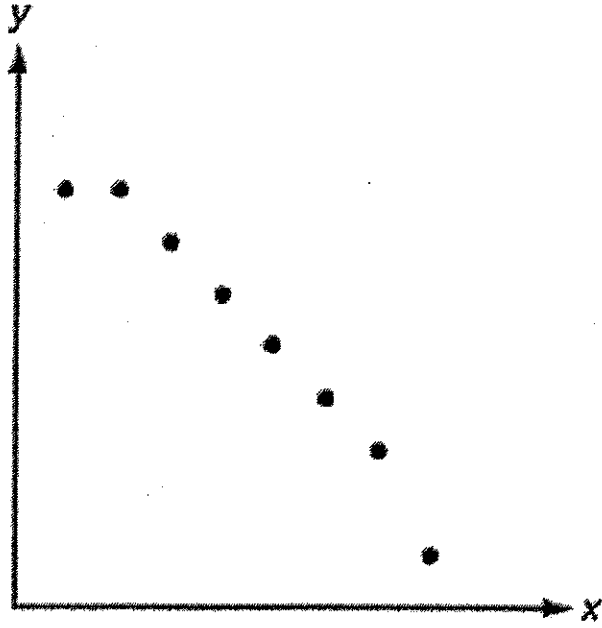
Equation B

$$f(x) = 2x - 1$$

- A: 4, B: 4
- A: 8, B: 4
- A: 4, B: 2
- A: 8, B: 16

Question 29

Which situation best fits the graph below and what type of correlation is it?



- distance traveled vs. cost of gas; negative correlation
- distance traveled vs. cost of gas; positive correlation
- time traveled vs. distance from destination; negative correlation
- time traveled vs. distance from destination; positive correlation

Question 30

If you organized the data shown in the stem-and-leaf plot below in a frequency table, which *could* be intervals?

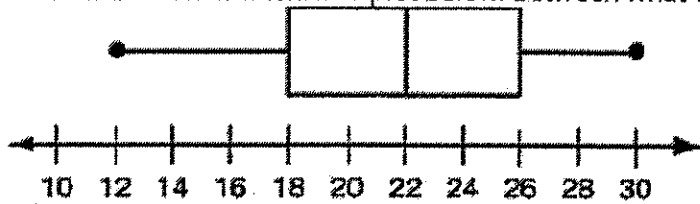
7	2	2	2	3
8	0	5	8	
9	3	7		
10	0			

Key: 8|0 = 80

- 70-80 and 80-90
- 70-79 and 80-84
- 70-79 and 80-89
- 70-80 and 80-90

Question 31

Look at the box-and-whisker plot below. Between what values does the middle half of the data fall?



- 12 and 18
- 12 and 30
- 18 and 26
- 22 and 30

Question 32

The monthly rents for five apartments advertised in a newspaper were \$650, \$650, \$740, \$1650, and \$820. Use the mean, median, and mode of the rents to answer the question. Which value best describes the monthly rents? Explain.

mean = \$902, median = \$740, mode = \$650

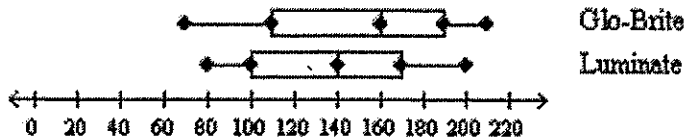
The mean best describes the rents because \$902 is the average rent.

The median best describes the rents because most of the rents were near \$740.

The mode best describes the rents because \$650 was the rent seen most often.

Question 33

The box-and-whisker plot shows the lifespan, in days, of two different brands of 60-watt light bulbs. Which data set has a greater median? About how much greater is the median of that data set?



Glo-Brite has a greater median by about 20 days.

Glo brite has a greater median by about 50 days.

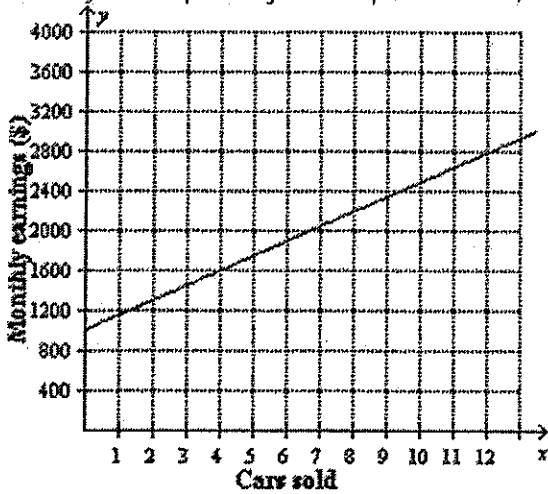
Luminate has a greater median by about 40 days.

Luminate has a greater median by about 20 days.

Question 34

The graph shows the amount earned in one month by a car salesperson who sells x cars during that month.

Identify the slope and y -intercept of the line, and explain what they mean in this real-world context.



slope = 1000

y -intercept = 150

The car salesperson earns \$150 per month plus \$1000 for each car he or she sells.

slope = 150

y -intercept = 1000

The car salesperson earns \$1000 per month plus \$150 for each car he or she sells.

slope = 1000

y -intercept = 150

The car salesperson earns \$1000 per month plus \$150 for each car he or she sells.

slope = 150

y -intercept = 1000

The car salesperson earns \$150 per month plus \$1000 for each car he or she sells.

Question 35

Find the median for the given sample data.

The ages (in years) of the eight passengers on a bus are listed below.

9 1 29 11 22 46 40 35

Find the median age.

25.5 yr

29 yr

24.5 yr

22 yr

Question 36

What type of function does the table represent?

x	y
-1	8
0	0
1	-2
2	2
3	12

- quadratic
- cubic
- linear
- exponential

Question 37

What type of function does the table represent?

x	y
-1	-3
0	-1
1	1
2	3
3	5

- quadratic
- absolute value
- linear
- cubic

Question 38

This equation represents what type of function?

$$y = 3x^2 - 5$$

- quadratic
- cubic
- linear
- exponential

Question 39

Which of the following is a quadratic function?

- $f(x) = 3x - 5$
- $f(x) = 3$
- $f(x) = 3x^4 - 2x^2 + 7$
- $f(x) = 2x^2 - 3x + 6$

Question 40

Classify the function $F(x) = (x - 2)^2 + 3$.

- Cubic Function
- Exponential Function
- Quadratic Function
- Reciprocal Function

Name _____

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		A	B	C	D		A	B	C	D
1.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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11.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	31.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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15.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	35.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	36.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	37.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	38.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	39.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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