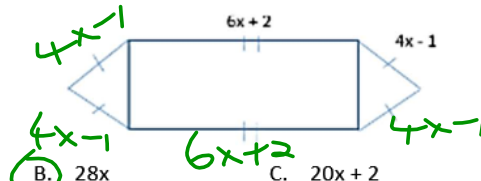


5/21/2021

GSE Algebra 1  
Final Exam Review

1. A model of a garden is shown. What is the perimeter of the model, in terms of  $x$ ?



- A.  $10x + 1$     B.  $28x$     C.  $20x + 2$     D.  $28x - 6$

$$\begin{array}{r} 6x+2 \\ + 6x+2 \\ \hline 12x+4 \end{array}$$

$$4(4x-1) = 16x-4$$

$$\begin{array}{r} 16x-4 \\ + 12x+4 \\ \hline 28x \end{array}$$

2. Which shows the equation  $A = nz + d$  solved for  $z$ ?

- S.  $z = \frac{A}{nd}$     T.  $z = \frac{A-d}{n}$     U.  $z = \frac{A}{n+d}$     V.  $z = \frac{A}{n-d}$

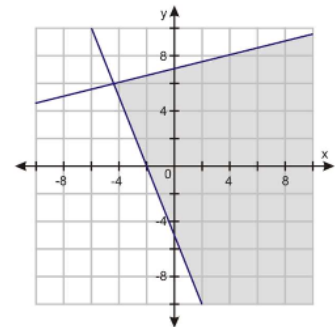
$$A = nz + d$$

$$\begin{array}{r} -d \\ \hline A-d = nz \end{array}$$

$$\begin{array}{r} \frac{A-d}{n} = \frac{nz}{n} \end{array}$$

3. Which of the following is a solution to the system of linear inequalities shown?

- W.  $(-4, 1)$     X.  $(-4, -1)$     Y.  $(4, 1)$     Z.  $(-4, -4)$



4. Simplify the following expression:  $\sqrt{30} \cdot 4\sqrt{2}$

- A.  $8\sqrt{15}$     B.  $8\sqrt{8}$     C.  $2\sqrt{15}$     D.  $6\sqrt{8}$

$$4\sqrt{60} = 4\sqrt{4 \cdot 15} = 4 \cdot 2\sqrt{15} = 8\sqrt{15}$$

5. Given  $h(x) = 3x - 7$ , find the value of  $h(2)$ .

- A.  $h(2) = 13$     B.  $h(2) = -6$     C.  $h(2) = -2$     D.  $h(2) = -1$

$$\begin{aligned} h(2) &= 3(2) - 7 \\ &= 6 - 7 \\ h(2) &= -1 \end{aligned}$$

$$\begin{array}{r} 60 \\ 1 \overline{) 60} \\ 2 \overline{) 30} \\ 3 \overline{) 20} \\ 4 \overline{) 15} \end{array}$$

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6. Determine the zeroes (x-intercepts) of the function  $x^2 - 4x - 32 = 0$

- S. {8, -4}      T. {-8, 4}      U. {8, 4}      V. {-8, -4}

$$\begin{array}{r} \begin{array}{c} -32 \\ 4 \times -8 \\ -4 \end{array} \\ \hline (x+4)(x-8) = 0 \\ x+4=0 \quad x-8=0 \\ x=-4 \quad x=8 \end{array}$$

7. Simplify  $(12p^2 + 15p + 3) - (2p^2 + 17p - 2)$ .

- O.  $10p^2 - 2p + 5$       P.  $10p^2 + 2p - 5$       Q.  $10p^2 - 2p + 1$       R.  $10p^4 - 2p^2 + 5$

$$\begin{array}{r} 12p^2 + 15p + 3 \\ - 2p^2 - 17p + 2 \\ \hline 10p^2 - 2p + 5 \end{array}$$

8. Find the vertex and axis of symmetry of the quadratic function.  $f(x) = 3(x-1)^2 + 4$

- O. (-1, -4) & x = -1      P. (3, 4) & x = 3      Q. (1, -4) & x = 1      R. (1, 4) & x = 1

axis of symmetry = x = h

change sign of h.

Vertex: (1, 4)

Axis of sym. = x = 1

9. Find the solution to the system  $\begin{cases} 2x + y = 7 \\ 3x - 4y = 5 \end{cases}$

- H. (-1, 9)      I. (3, 1)      J. Infinite Solutions      K. No Solution

$$\begin{array}{r} 2x + y = 7 \quad \times 4 \\ 3x - 4y = 5 \\ \hline 8x + 4y = 28 \\ + 3x - 4y = 5 \\ \hline 11x = 33 \\ \hline x = 3 \end{array}$$

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10. Complete the square for the expression  $x^2 - 12x + \frac{36}{2}$ . What is the result as a binomial squared?  
 L.  $(x + 6)^2$     M.  $(x - 6)^2$     N.  $(x - 12)^2$     O.  $(x + 36)^2$
- $\frac{36}{2} = (-6)^2 = 36$

11. What is the product of  $2x - 6$  and  $x + 11$ ?  
 A.  $x^2 - 66x + 16$     B.  $x^2 + 16x + 11$     C.  $2x^2 + 16x - 66$     D.  $2x^2 + 11x - 66$

$$\begin{array}{r} 2x - 6 \\ \times x + 11 \\ \hline 2x^2 - 6x \\ 22x - 66 \\ \hline 2x^2 + 16x - 66 \end{array}$$

Dimensional Analysis

12. On average, the human eye is said to blink 17 times per minute. Determine how many times (on average) the human eye blinks in one day.  
 L. 408 blinks/day    M. 1,020 blinks/day    N. 24,480 blinks/day    O. 1,468,800 blinks/day

$$\frac{17 \text{ blinks}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{24 \text{ hrs}}{1 \text{ day}} =$$

The number of t-shirts produced by a factory is given by the expression  $120x + 200$  where the variable  $x$  represents the number of hours that the factory has been open.

13. What is the meaning of the constant in the expression?  
 S. The factory produces 200 t-shirts every hour  
 T. The factory produces 120 t-shirts every hour  
 U. The factory started the day with 200 t-shirts produced  
 V. The factory started the day with 120 t-shirts produced
14. What is the meaning of the coefficient in the expression?  
 E. The factory produces 120 t-shirts every hour  
 F. The factory produces 200 t-shirts every hour  
 G. The factory started the day with 120 t-shirts produced  
 H. The factory started the day with 200 t-shirts produced

$mx + b$   
 rate of change  
 initial value

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$y = mx + b$   
Write the equation

15. Which function represents the data in the table?

x	1	4	7	8
y	2.25	3	3.75	4

- H.  $y = \frac{x}{4} + 2$     I.  $y = 2x - 5$     J.  $y = \frac{3x}{4} + 2$     K.  $y = \frac{x}{4} - 1$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3.75 - 3}{7 - 4} = 0.25$  or  $\left(\frac{1}{4}\right)$

Choose point =  $(4, 3)$   
 $3 = \frac{1}{4}(4) + b$   
 $3 = 1 + b$   
 $3 - 1 = b$      $b = 2$

16. Several input- and output- values of the quadratic function  $g(x)$  on the interval  $[5, 11]$  are displayed below.

x	5	6	7	8	9	10	11
y	22	23	22	19	14	7	-2

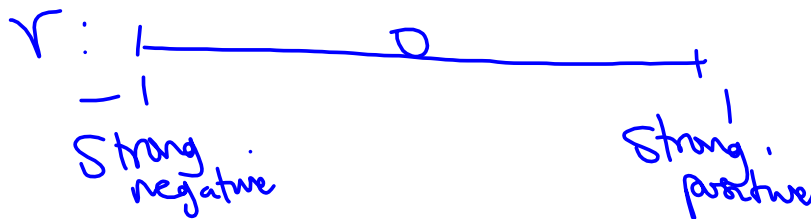
Which represents the average rate of change of  $g(x)$  on the interval  $[6, 11]$ ?

- E. -6    F. -5    G. -4    H. -3

$ROC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 23}{11 - 6} = -5$

17. Susie has a love of animals and is studying whether or not the age of a chicken has an effect on the number of eggs it produces. She constructed a scatter plot with her data and determined a line of best fit. The correlation coefficient was found to be -0.712. Which of the following conclusions could Susie make from her data?

- W. As the chicken ages, the number of eggs it produces decreases.  
 X. As the chicken ages, the number of eggs it produces remains roughly the same  
 Y. As the chicken ages, the number of eggs it produces increases  
 Z. As the chicken ages, the number of eggs it produces increase and then decreases

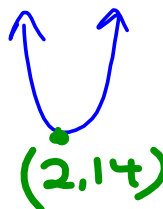


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18. Which of the following equations represents a parabola that reaches its minimum at (2, 14)?

- L.  $y = (x - 2)^2 + 14$
- M.  $y = (x + 2)^2 - 14$
- N.  $y = -(x - 2)^2 + 14$
- O.  $y = -(x + 2)^2 - 14$



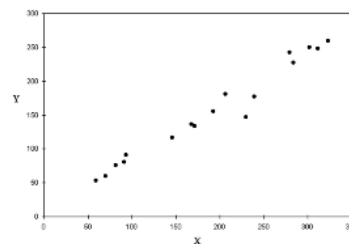
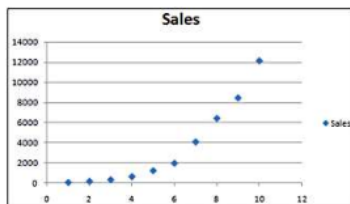
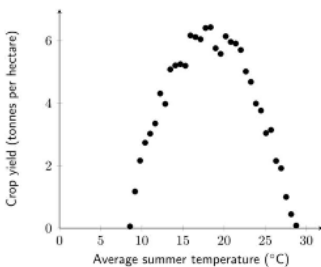
19. Given the function  $g(x) = 3 \cdot 2^x - 1$ , what is the value of  $g(4)$ ? 47

$$g(4) = 3(2)^4 - 1$$

$$3(16) - 1$$

$$48 - 1$$

20. Determine whether the following represent quadratic, exponential, or linear functions.



Quadratic

Exponential

Linear

← h ← k  
+4 +5

21. The function  $f(x) = x - 3$  is shifted 4 units left and 5 units up. Write the equation of the new function.

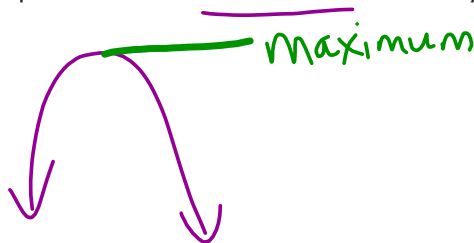
$$f(x) = (x + 4) + 2$$

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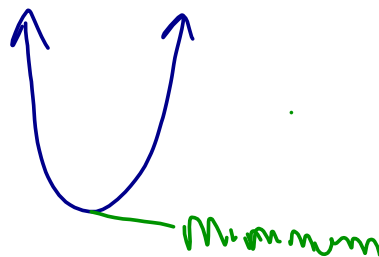
22. Define the following number sets and give examples of each.

Number Set	Definition	Examples
Natural Numbers	Counting numbers	1, 2, 3, 4, ...
Integers	positive and negative whole #s including 0	-1, 0, 1, 2, ...
Rational Numbers	Numbers that can be written as a fraction Repeating and terminating decimals	$0.\bar{3}$ , $3\bar{4}$ , $4/7$ $\sqrt{4}$ , $1.5$ $0.\bar{45}$ , $3.5$
Irrational Numbers	#s that cannot be expressed as a fraction	$\pi$ , $\sqrt{3}$ , $\sqrt{7}$ $\sqrt{22}$

23. Draw a sketch of a parabola that has a maximum value. What do you know about the  $a$  value for this function?



24. Draw a sketch of a parabola that has a minimum value. What do you know about the  $a$  value for this function?



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25. A random survey was performed at a local mall to see whether people would prefer to drive an SUV or sports car. The results are shown below.

	Sport Utility Vehicle (SUV)	Sports Car	Totals
male	21	39	60
female	135	45	180
Totals	156	84	240

$$\frac{45}{180} = 0.25 = 25\%$$

Of the female participants, what percentage prefer the sports car?

$$y = mx + b$$

26. A linear equation is provided below. What is the equation in terms of y?

$$3x - 8y = 8$$

Solve for y

$$-8y = -3x + 8$$

$$y = \frac{3x}{8} - 1$$

27. The general form of an exponential growth/decay function is  $y = ab^x$ . Identify the meaning of each variable.

a: y-intercept or initial value      b: Common ratio or growth/decay factor      x: time

28. The following data set represents the high temperatures in a local city within a two-week period. What was the average high temperature?

Add/÷ 14

77, 81, 80, 82, 82, 79, 77, 76, 78, 81, 84, 83, 81, 76

$$\bar{x} = 79.8$$

$\bar{x}$

The surest way not to fail is

to be determined to succeed.

