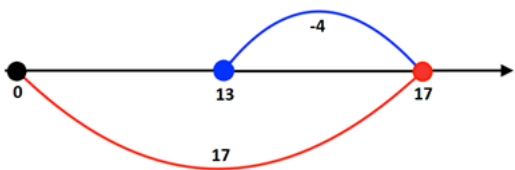
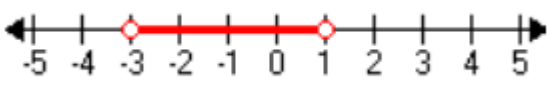


1.	<p><b>Simplify</b> the expression: <math>2 + (3 + 5 - 9)</math></p>	6.	<p><b>Select</b> an appropriate <i>first</i> step to solve the equation:  <math>(4x + 1) - 3x = 9</math></p> <p>A) <math>x + 1 = 9</math>                      B) <math>7x + 1 = 9</math>                      C) <math>-12x^2 - 3x = 9</math>              D) <math>5x - 3x = 9</math></p>
2.	<p><b>Select</b> the expression shown on the graph.</p>  <p>A) <math>0 + 17</math>                      B) <math>-4 - 17</math>                      C) <math>17 - 4</math>                      D) <math>-4 - 17</math></p>	7.	<p><b>Select</b> the option that is a valid solution to the inequality.</p> <p><math>-2(3x + 2) &gt; 8</math></p> <p>A) <math>x &gt; -1</math>                      B) <math>x &lt; -1</math>                      C) <math>x &gt; -2</math>                      D) <math>x &lt; -2</math></p>
3.	<p>Your friend is simplifying an expression and performs the following steps.</p> $(-3x)^2 + (2x - 3) + 5$ <p>1. <math>-9x^2 + (2x - 3) + 5</math></p> <p>2. <math>-9x^2 + 2x - 3 + 5</math></p> <p>3. <math>-9x^2 + 2x + 2</math></p> <p><b>Select</b> the appropriate description of your friend's error.</p> <p>A) In Step 1, your friend did not square correctly.                      B) In Step 2, your friend did not distribute correctly.                      C) In Step 3, your friend did not combine like terms correctly.                      D) Your friend did not make any errors.</p>	8.	<p><b>Solve</b> the equation.</p> $3 2x - 1  = 15$ <p>A) <math>x = -2</math>                      B) <math>x = -3</math>                      C) <math>x = -2, 3</math>                  D) <math>x = 2, -3</math></p>
4.	<p><b>Evaluate</b> the expression for <math>x = -2</math>,</p> $\frac{1}{3}(4x - 1) - x + 1$	9.	<p><b>Select</b> the absolute value equation that corresponds to the solution set shown.</p>  <p>A) <math> 2x + 2  &lt; 4</math>                      B) <math> x - 1  \leq 4</math>                      C) <math> 2x - 2  &gt; 4</math>                      D) <math>2 x - 1  &lt; 4</math></p>
5.	<p>You are building a walkway around your pool. The length of the walkway should be 6 feet longer than the width, <math>x</math>. Write a simplified expression for the perimeter of the walkway.</p> <p>A) <math>4x - 12</math>                      B) <math>2x + 6</math>                      C) <math>4x + 12</math>                      D) <math>4x + 6</math></p>	10.	<p>Ken has to spend 25 minutes reading Statistics tonight. He also has to solve 12 math problems. If he only has 45 minutes before he must leave for soccer practice, <b>select</b> the equation below which can be solved for the number of minutes he will be able to spend per problem if he wants to complete the reading and the math in the given time.</p> <p>A) <math>45 = 25 - 12x</math>                      B) <math>45 = 25 + 12x</math>                      C) <math>45 = 25x + 12</math>                      D) <math>70 = 25x - 12</math></p>

11. Suppose a function relates the number of chicken wings,  $w$ , to the total cost of the meal  $c(w)$ . What does  $c(15) = 10$  mean?

a) Every 15 wings will earn \$10 profit  
 b) Every 10 wings will earn \$15 profit  
 c) A meal with 15 wings will cost \$10  
 d) A meal with 10 wings will cost \$15

12. Evaluate the function  $f(x)$  for  $f(2)$ .

$$f(x) = 3\left(\frac{1}{2}x + 2\right) - 1$$

13. Which of the following represent functions and which represent relations?

**A**

**B**

**C**

**D**

**E**

14. Select the real world situation that could be represented by the graph shown.

A) Joe has \$25 in savings and plans to save \$5 per day  
 B) Jim has \$25 in savings and plans to spend \$5 per day.  
 C) Josefina has \$5 in savings and plans to save \$25 per day.  
 D) Josie starts off with \$5 but loses \$25 per day.

15. Select the interval for which the function shown is positive.

A)  $x < 6$     B)  $x > 6$     C)  $x > 3$     D)  $x < 3$

16. Select the common ratio or common difference for the sequence.

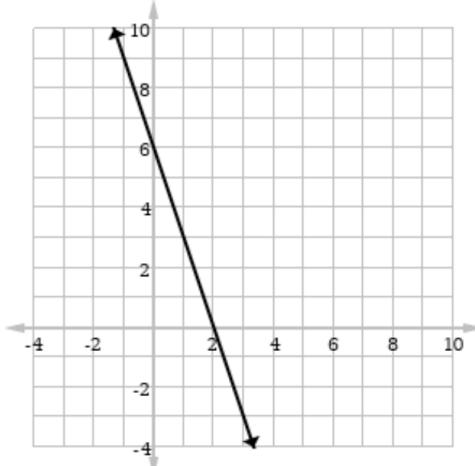
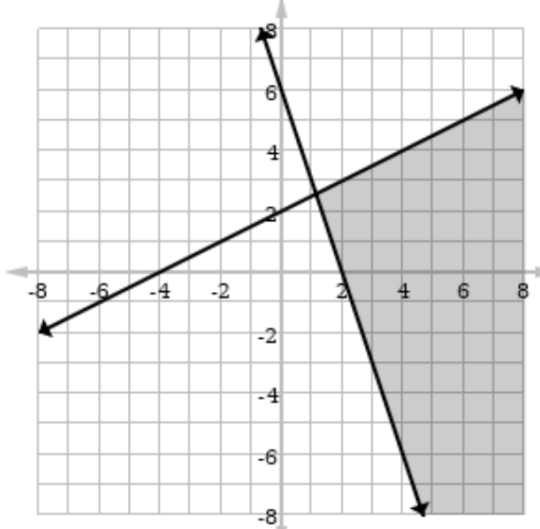
$$\frac{1}{2}, \frac{3}{4}, 1, \dots$$

A) Common ratio of  $\frac{1}{4}$   
 B) Common difference of  $\frac{1}{4}$   
 C) Common ratio of  $\frac{1}{4}$   
 D) Common difference of  $-\frac{1}{4}$

17. Select the explicit formula for the sequence.

18, 10, 2, -6...

A)  $f(n) = 18 + 6(n-1)$     B)  $f(n) = 18 + 6n$   
 C)  $f(n) = 18 - 6(n-1)$     D)  $f(n) = 18 - 6n$

<p>18. <b>Select</b> the explicit formula for the sequence.</p> <p><math>1, -\frac{3}{5}, \frac{9}{25}, -\frac{27}{125}, \dots</math></p> <p>A) <math>f(n) = 1 \cdot \left(-\frac{3}{5}\right)^{n-1}</math></p> <p>B) <math>f(n) = 1 \cdot \left(\frac{3}{5}\right)^{n-1}</math></p> <p>C) <math>f(n) = 1 + (n-1)\left(-\frac{3}{5}\right)</math></p> <p>D) <math>f(n) = -\frac{3}{5} \cdot (1)^{n-1}</math></p>	<p>20. Using the <b>slope-intercept form</b>, write the equation of the line through the point <math>(-2, 5)</math> with a slope of <math>1/3</math>.</p>
<p>19. <b>State</b> the slope and the y-intercept of the function.</p> 	<p>21. You would like to fund the purchase of a new \$250 gaming console by raking leaves (<math>x</math>) and mowing lawns (<math>y</math>). You charge \$10/hour to rake leaves and \$15/hour to mow lawns. Write a linear inequality that represents this situation.</p> <p>A) <math>10x + 15y \geq 250</math>    B) <math>x + y \geq 250</math></p> <p>C) <math>x + y \leq 250</math>        D) <math>10x + 15y \leq 250</math></p>
<p>23.</p> 	<p>22. <b>Find</b> the ordered pair that is the solution to the system of linear equations.</p> <p><math>2x + 3y = 12</math></p> <p><math>x - 6y = 21</math></p> <p><b>Select</b> the system of linear inequalities described by the graph.</p> <p>A) <math>f(x) \geq \frac{1}{2}x + 2</math>                      B) <math>f(x) \leq \frac{1}{2}x + 2</math></p> <p>         <math>g(x) \leq 3x + 6</math>                      <math>g(x) \geq -3x + 6</math></p> <p>C) <math>f(x) \leq -\frac{1}{2}x</math>                              D) <math>f(x) \leq -\frac{1}{2}x + 2</math></p> <p>         <math>g(x) \geq 3x + 6</math>                      <math>g(x) \geq 3x + 6</math></p>

**For questions 24, 25 and 26, refer to the information below:**

Crystal recorded the following data as part of a school project on grade level and ice-cream preference.

	Grade Level				
	Freshman	Sophomore	Junior	Senior	Total
Chocolate	45	75	56	43	219
Vanilla	32	68	59	78	237
Total	77	143	115	121	456

24. **Calculate** the percent of surveyed students which are Sophomores preferring chocolate ice cream.
25. Given a student is a Junior, **calculate** the probability that they prefer Vanilla ice cream.
26. Using the above scenario as an example, **write** an appropriate big idea to answer the essential question, "how can we compare the choices of two different groups?"

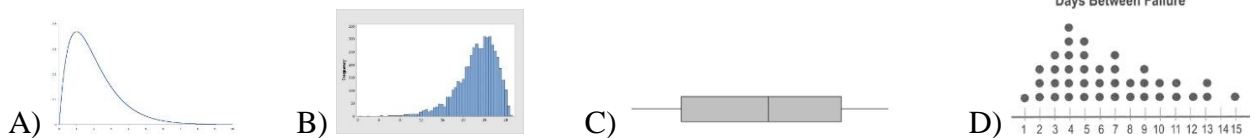
**For questions 24, 25 and 26, refer to the information below:**

You are comparing the ACT scores of students in two rival Academic Decathlon Teams.

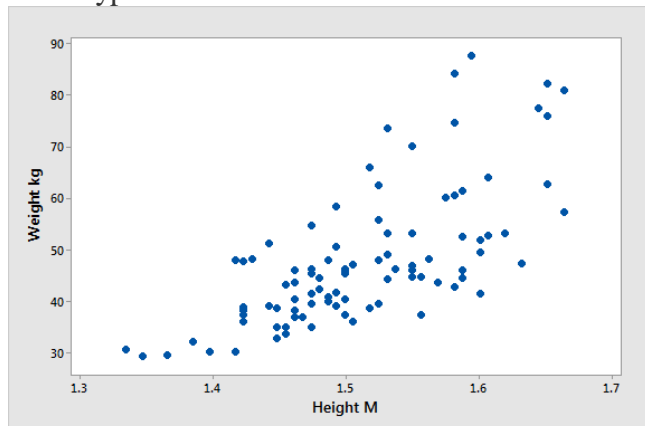
Team Alpha (ACT scores): 20, 20, 20, 22, 24, 26, 26, 28, 32, 33

Team Epsilon (ACT scores): 15, 18, 20, 27, 28, 30, 30, 32, 33, 34

27. **Calculate** the measures of center (mean and median) and compare them for the two Teams.
28. **Calculate** and compare the measures of spread (range and IQR) for the data sets.
29. **Select** all data sets that appears to be skew right.



30. What type of correlation is shown?



**Describe** the correlation of the data set.

- A) Weak positive correlation.
- B) Weak negative correlation.
- C) Strong negative correlation.
- D) Strong positive correlation.

31.	<p>Veronica found the linear regression of her data set (shown below) to be <math>y = 1.6x + 31.2</math></p> <table border="1"> <tr> <td>Time (minutes)</td> <td>2</td> <td>5</td> <td>6</td> <td>8</td> <td>11</td> </tr> <tr> <td>Temperature (degrees C)</td> <td>35</td> <td>39</td> <td>43</td> <td>44</td> <td>51</td> </tr> </table> <p>Using the equation Veronica found, <b>calculate</b> the residual for the data point at time 8 minutes.</p>	Time (minutes)	2	5	6	8	11	Temperature (degrees C)	35	39	43	44	51
Time (minutes)	2	5	6	8	11								
Temperature (degrees C)	35	39	43	44	51								
32.	<p><b>Select</b> the equivalent expression rewritten as a radical</p> $32^{\frac{3}{5}}$ <p>A) <math>\sqrt[3]{32}</math>      B) <math>(\sqrt[3]{32})^5</math>  C) <math>\frac{3 \cdot 32}{5}</math>      D) <math>\sqrt[5]{32^3}</math></p>												
33.	<p><b>Calculate</b> the simplified form of the expression.</p> $\sqrt{75} - 2\sqrt{3}$												
34.	<p><b>Calculate</b> the simplified form of the expression.</p> $(3x - 2)(2x + 5)$												
35.	<p><b>Calculate</b> the factored form of the expression.</p> $x^2 - 64$												
36.	<p><b>Calculate</b> the factored form of the expression.</p> $x^2 + x - 20$												
37.	<p><b>Write</b> a function that represents <math>f(x) = -4x^2</math> after a translation 3 units to the left and 1 unit down.</p>												

38.	<p><b>State</b> the domain and range of the function.</p> <p style="text-align: center;"><math>y = -x^2 - 2x + 3</math></p> <p>Domain: _____ Range: _____</p>
39.	<p><b>For the graph in number 38, Write</b> the interval on which the quadratic is decreasing. Then <b>write</b> the interval on which the quadratic is increasing.</p> <p>Decreasing: _____</p> <p>Increasing: _____</p>
40.	<p><b>Describe</b> the big idea that answers the essential question, “how do the parameters a, h, and k affect the graph of quadratic functions?”</p>
41.	<p><b>Calculate</b> the zero(es) of the quadratic function.</p> $f(x) = x^2 + 2x - 15$
42.	<p><b>Select</b> the solution(s) to the quadratic function.</p> $0 = x^2 + 12x + 7$ <p>A) <math>x = -6 \pm \sqrt{7}</math>      B) No Solution  C) <math>(-3, 0)</math> and <math>(-4, 0)</math>      D) <math>x = -6 \pm \sqrt{29}</math></p>

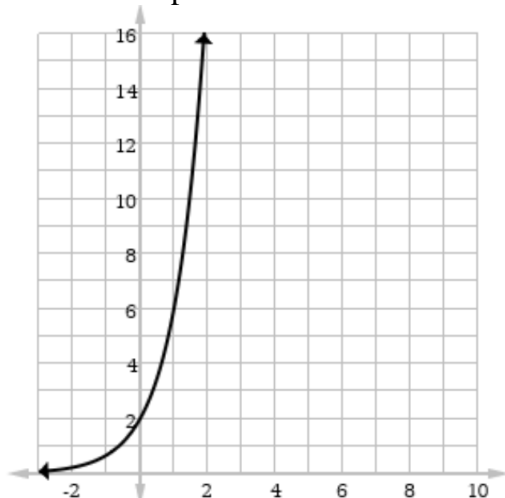
43. **Calculate** the vertex of the quadratic function.

$$y = x^2 + 6x + 5$$

44. Courtney is building a rectangular wading pool. She wants the area of the bottom to be 54 square feet. She also wants the length of the pool to be 3 ft longer than twice its width. The width of the pool is represented by the variable  $x$ . **Write** the quadratic equation that represents the situation.

Equation:  $f(x) =$

45. **Write** the exponential function that corresponds to the graph shown.



46. Assuming an exponential function is responsible for creating the table of values below, **calculate** the population of bacteria corresponding to time 6 minutes.

Time (minutes)	Bacteria Population
1	4
2	20
3	100

47. Are the statements always true, sometimes true, or never true?

- Linear functions are increasing. \_ (always / sometimes / never)
- Exponential functions have constant differences. \_ (always / sometimes / never)
- Linear functions have constant differences. \_ (always / sometimes / never)
- Exponential functions are increasing. \_ (always / sometimes / never)

**Write** the big idea that answers the essential question, “how do linear and exponential functions differ.”