We’ve redesigned the packet and provided a pacing guide for the work beginning the first week of July. We *strongly suggest* that students work at the suggested pace throughout the summer rather than all at once right after school ends or just before the beginning of the year.

All work should be completed *individually.*
Questions can & should be completed **WITHOUT using a calculator** (aside from those listed as allowing calculator use)

*Challenge yourself. Some questions will be simple while others may be difficult. Take your time, show your work and do your best. If you need help, you can use Khan Academy and search the Standards shown in the pacing guide below. Have a wonderful summer and see you in the Fall!*

**Pacing Guide**

<table>
<thead>
<tr>
<th>Week</th>
<th>Questions</th>
<th>Standards Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1 – 7 (Week 1)</td>
<td>8</td>
<td>8.NS.1, 8.NS.2, 8.EE.1, 8.EE.2</td>
</tr>
<tr>
<td>July 8 – 14 (Week 2)</td>
<td>8</td>
<td>8.EE.3, 8.EE.4, 8.EE.5, 8.EE.6</td>
</tr>
<tr>
<td>July 15 – 21 (Week 3)</td>
<td>8</td>
<td>8.EE.7, 8.EE.8, 8.F.1, 8.F.2</td>
</tr>
<tr>
<td>July 22 – 28 (Week 4)</td>
<td>8</td>
<td>8.F.3, 8.F.4, 8.F.5</td>
</tr>
<tr>
<td>Aug 5 – Aug 11 (Week 6)</td>
<td>7</td>
<td>8.G.6, 8.G.7, 8.G.8, 8.G.9</td>
</tr>
<tr>
<td>Aug 12 – 18 (Week 7)</td>
<td>8</td>
<td>8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4</td>
</tr>
</tbody>
</table>

57 Total

YOU MUST BRING THIS COMPLETED PACKET WITH YOU ON THE FIRST DAY OF SCHOOL.

Name: _______________________________
1. Which of the following numbers is to the right of 6 on a number line? Select two that apply.
   A. \(-\sqrt{79}\)
   B. \(\sqrt{2}\)
   C. \(\sqrt{91}\)
   D. \(\sqrt{7}\)
   E. \(-\sqrt{23}\)
   F. \(\sqrt{47}\)

2. In the equation \(x^2 = 9\), what is the positive value of \(x\)?

3. Select all the numbers below that are irrational.
   A. 3.33333
   B. \(\frac{13}{24}\)
   C. \(\sqrt{25}\)
   D. 5462.263
   E. \(\sqrt{19}\)
   F. \(\sqrt{61}\)

4. The value of \(e\), a widely used irrational number, is approximately \(2.718281828\). How many repeating digits does \(e\) have after the decimal point?
   A. 0
   B. More than 3
   C. 2
   D. 3

5. Given that the value of \(\pi\) is approximately 3.14159265, what can you determine if you know that \(1.77^2 = 3.1329\)?
   A. that \(\sqrt{\pi}\) is less than 1.77 and is to the left of 1.77 on a number line
   B. that \(\sqrt{\pi}\) is less than 1.77 and is to the right of 1.77 on a number line
   C. that \(\sqrt{\pi}\) is greater than 1.77 and is to the left of 1.77 on a number line
   D. that \(\sqrt{\pi}\) is greater than 1.77 and is to the right of 1.77 on a number line

6. Which of the following has the same value as \(\frac{5^3 - 7}{5^2}\)?
   A. \(-\frac{15}{10}\)
   B. \(\frac{5}{1}\)
   C. \(\frac{25}{125}\)
   D. \(-\frac{125}{25}\)

7. Simplify \(2^{-4}\).
   A. \(-8\)
   B. \(-16\)
   C. \(\frac{1}{16}\)
   D. \(\frac{1}{8}\)

8. Solve.
   \(\sqrt{343} = \underline{\hspace{2cm}}\)
1. In 2015, there were about 22 million teenagers (aged 13–17) in the United States. They each sent an average of 900 text messages per month. About how many text messages did all of the teenagers in the United States send each month? Express your answer using scientific notation in the box.

Evaluate:

\((2.4 \times 10^4)(4.5 \times 10^3)\)

A. \(1.08 \times 10^7\)
B. \(1.08 \times 10^8\)
C. \(1.08 \times 10^{12}\)
D. \(1.08 \times 10^{13}\)

3. How should \(5.6 \times 10^7\) be written in standard form?

A. \(0.0000056\)
B. \(5,600,000\)
C. \(50,600,000\)
D. \(56,000,000\)

4. Which expression is equivalent to \((9.5 \times 10^5) – (2.3 \times 10^4)\)?

A. \(7.2 \times 10\)
B. \(9.27 \times 10\)
C. \(7.2 \times 10^5\)
D. \(9.27 \times 10^5\)
The price of an adult admission ticket to the zoo is twice as much as the price of a child admission ticket. Which line on the graph depicts the cost of an adult's ticket relative to the cost of a child's ticket?

A.  

B.  

C.  

D.  

$10 \uparrow$

$8$

$6$

$4$

$2$

0

$2$

$4$

$6$

$8$

$10$

0

$2$

$4$

$6$

$8$

$10$

$10 \uparrow$

$8$

$6$

$4$

$2$

0

$2$

$4$

$6$

$8$

$10$

$10 \uparrow$

$8$

$6$

$4$

$2$

0

$2$

$4$

$6$

$8$

$10$

$10 \uparrow$

$8$

$6$

$4$

$2$

0

$2$

$4$

$6$

$8$

$10$

$10 \uparrow$

$8$

$6$

$4$

$2$

0

$2$

$4$

$6$

$8$

$10$
6. This graph shows a proportional relationship between the amount of money in Jack's savings account and the number of weeks Jack has been saving money.

![Jack's Savings Account](image)

Which statement identifies the correct slope, and the correct interpretation of the slope for this situation?

A. The slope of the line is \( \frac{6}{1} \), so Jack's savings rate is $6 per week.

B. The slope of the line is \( \frac{6}{1} \), so Jack's savings is $1 for every 6 weeks.

C. The slope of the line is \( \frac{1}{6} \), so Jack's savings is $6 for every 1 weeks.

D. The slope of the line is \( \frac{1}{6} \), so Jack's savings is $1 for every 6 weeks.

7. This graph represents a linear function.

![Graph](image)

Which equation is represented by this graph?
Lines $m$ and $n$ are parallel. Both lines are translated 4 units up and 3 units right to form lines $m'$ and $n'$. The slope of line $m'$ is $\frac{3}{5}$.

Enter the slope of line $n'$.
1. A student's work showed "x = -3" as the solution to the equation \(2x = -6\). How can you check this student's work?
   A. The solution cannot be checked/confirmed.
   B. Substitute "-3" for "x" into the equation \(2x = -6\).
   C. Multiply both sides of the equation by 2.
   D. None of the above.

2. The graph shown compares the height of Tree A and the height of Tree B over time (in years).

   ![Tree Heights Graph]

   How many years after Tree B was planted did Tree A and Tree B have the same height?

3. What is the solution to the system of equations below?
   \[
   \begin{align*}
   3x + 4y &= -2 \\
   2x - 4y &= -8
   \end{align*}
   \]
   A. \(x = 2, y = -2\)
   B. \(x = 6, y = -5\)
   C. \(x = 4, y = 4\)
   D. \(x = -2, y = 1\)

4. Select all ordered pairs that correspond to input-output pairs of the function \(y = -6x + 7\)
   A. \((1, 1)\)
   B. \((-1, 1)\)
   C. \((-6, 7)\)
   D. \((3, -11)\)

5. Which statement best describes why this set of ordered pairs is not a function?
   \[((1, 5), (2, 6), (3, 6), (4, 1), (4, 20), (5, 21), (6, 24))\]
   A. There is no value \(k\) such that \(y = kx\) for all the ordered pairs.
   B. The \(y\)-value of 6 is paired with two different \(x\)-values.
   C. The \(x\)-value of 1 is mapped to 5, but the \(x\)-value of 5 is not mapped to 1.
   D. The \(x\)-value of 4 is paired with two different \(y\)-values.

6. This table shows the relationship between the cost of a personal cheese pizza at Store A and the number of additional toppings for the pizza.

<table>
<thead>
<tr>
<th># of Toppings</th>
<th>Cost in dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$7.99</td>
</tr>
<tr>
<td>1</td>
<td>$8.99</td>
</tr>
<tr>
<td>2</td>
<td>$9.99</td>
</tr>
<tr>
<td>3</td>
<td>$10.99</td>
</tr>
</tbody>
</table>

   The following equation shows the relationship between the cost \(C\) of a personal cheese pizza at Store B and the number of additional toppings \(t\) for the pizza.
   \[C = 9 + 0.50t\]

   What is the difference, in dollars, between the personal cheese pizzas at both stores with 0 additional toppings?
   $
Directions: Answer the following question(s).

2. Solve the linear equation: 

\[-3x = 12\]

8. A swimming pool has 30 gallons of water in it. Water is added to the pool at the rate of 5 gallons per second.

Which equation models the relationship between \(W\), the number of gallons of water, and \(t\), the number of seconds water is being added to the swimming pool?

A. \(W = 30t + 5\)
B. \(W = 5t + 30\)
C. \(W = t + 35\)
D. \(W = 35t\)
1. If \( x \) and \( y \) are variables and \( b \) and \( m \) are constants, which of these functions is linear? Assume that \( m \neq 0 \).
   A. \( y = mx + b \)
   B. \( y = mx^2 + b \)
   C. \( y = m^x + b \)
   D. \( y = x^m + b \)

2. Which of these is a correct statement about the function graphed below?

   A. Its equation is \( y = x + 2 \), so it is a linear function.
   B. Its equation is \( y = x + 2 \), so it is not a linear function.
   C. Its equation is \( y = x^2 + 2 \), so it is a linear function.
   D. Its equation is \( y = x^2 + 2 \), so it is not a linear function.

3. The graph below represents a linear function.

Which of the following equations represents the graph?

A. \( y = \frac{3}{4}x - 3 \)
B. \( y = \frac{3}{4}x + 4 \)
C. \( y = \frac{4}{3}x - 3 \)
D. \( y = \frac{4}{3}x + 4 \)
4. Look at the table shown below.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>94</td>
</tr>
<tr>
<td>1</td>
<td>38</td>
</tr>
</tbody>
</table>

Which situation(s) could be modeled by the table shown? Select two that apply.

A. A driver already drove 10 miles. Now she is driving at a rate of 28 miles per hour.
B. A driver already drove 38 miles. Now she is driving at a rate of 56 miles per hour.
C. A shopper needs to buy shelves for $56 each. He will also purchase $28 in other merchandise.
D. A shopper needs to buy shelves for $28 each. He will also purchase $10 in other merchandise.
E. A student read 10 pages in her book already and is currently reading at a rate of 56 pages per hour.
F. A student read 38 pages in her book already and is currently reading at a rate of 28 pages per hour.

5. Which of these statements are correct about the relationship between x and y based on the graph? Select three that apply.

A. x is increasing when y is between −5 and −4
B. y is decreasing when x is between −4 and −2
C. y is increasing when x is between 1 and 2
D. x is decreasing when y is between 4 and 5
E. y is increasing when x is between 2 and 3
F. y is decreasing when x is between −1 and 2

6. In the graph shown, at what values of x does the value of y change from increasing to decreasing or decreasing to increasing? Select two that apply.
7. Hector purchased a used car and the graph below shows the number of miles on the car since he bought it. Which of these is a correct statement based on the graph?

A. Hector is driving the car 2000 miles per month.
B. Hector is driving the car 3000 miles per month.
C. The car had 2000 miles on it when Hector bought it.
D. The car had 3000 miles on it when Hector bought it.

8. Maria and her parents are hiking in the mountains. During one hike, Maria monitored their changing elevation and displayed it in the graph below.

Maria’s Elevation Over Time

Which of the following best describes a functional relationship shown in the graph?

A. Maria’s elevation remained constant for two hours.
B. Maria’s elevation decreased between 1:00 and 3:00.
C. Maria’s elevation increased between 9:00 and 12:00.
D. Maria spent more time decreasing her elevation than increasing her elevation.
Directions: Answer the following question(s).

1. Four students in a geometry class each did an experiment in which they translated a line segment in a coordinate plane 5 units up. The table shows the length of each student's line segment before and after the translation.

<table>
<thead>
<tr>
<th>Student</th>
<th>Length of Line Segment Before Translation</th>
<th>Length of Line Segment After Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jack</td>
<td>27 units</td>
<td>27 units</td>
</tr>
<tr>
<td>Layla</td>
<td>16 units</td>
<td>21 units</td>
</tr>
<tr>
<td>Nick</td>
<td>22 units</td>
<td>27 units</td>
</tr>
<tr>
<td>Savannah</td>
<td>15 units</td>
<td>20 units</td>
</tr>
</tbody>
</table>

Who must have made a mistake? Select three that apply.
A. Jack
B. Layla
C. Nick
D. Savannah

2. Which parallelogram is congruent to the parallelogram below?

A. 
B. 
C. 
D. 
Which figure is congruent to the rectangle above?

A. 

B. 

C. 

D. 

4 If point \((m, n)\) is reflected over the y-axis, what are the coordinates of its image?

A. \((m, -n)\)
B. \((-m, n)\)
C. \((n, m)\)
D. \((-m, -n)\)
5. What is the measure of \( \angle M \) in the figure below?

6. Line segment \( AB \) begins at \((-3, 7)\) and ends at \((-3, 2)\). The segment is translated 2 units right and 4 units down to form line segment \( A'B' \).

   Enter the length, in units, of line segment \( A'B' \):

   [ ] units

7. Look at Triangle \( QRS \) and Triangle \( Q'R'S' \) on the coordinate plane.

   Which transformation performed on Triangle \( QRS \) will produce the image of Triangle \( Q'R'S' \)?
   A. a translation of 6 units to the right
   B. a clockwise rotation of 90 degrees about the origin
   C. a reflection over the \( x \)-axis
   D. a reflection over the \( y \)-axis

8. Suppose figure \( A \) underwent a dilation to produce figure \( B \). Are figure \( A \) and figure \( B \) similar?
   A. No, because even though their side lengths are the same, their internal angles are different.
   B. No, because both their internal angles and their side lengths are different.
   C. Yes, because even though their side lengths are different, their internal angles are the same.
   D. Yes, because both their side lengths and their internal angles are the same.
9 An engineer is planning to construct triangular halls on a new construction site. A scale model of the engineer's triangular halls is shown below. Each unit represents 10 feet.

Triangular Halls on Construction Site

Which of the following statements are true about this scale model? Select three statements that apply.

A. Hall C is similar to Hall A.
B. Hall C is similar to Hall B.
C. Hall C is congruent to Hall A.
D. Hall B is congruent to Hall A.
E. The scale factor of dilation applied to Hall B to produce Hall C is 5.

10 Use the angle relationship in the figure below to solve for $x$. Assume that lines $a$ and $b$ are parallel and the given angles are given in degrees.

$x = \_\_\_$
1. Judy began her proof of the converse of the Pythagorean theorem by drawing triangle $ABC$ with side lengths in inches of 5, 12, and 13. She then showed that $5^2 + 12^2 = 13^2$ as follows.

$$5^2 + 12^2 = 13^2$$
$$25 + 144 = 169$$
$$169 = 169$$

Next, she drew triangle $DEF$, with two of the sides forming a $90^\circ$ angle. If she has done her proof correctly so far, which of these is a length of one of the sides forming the $90^\circ$ angle? Select two that apply.

A. 3 in.
B. 4 in.
C. 5 in.
D. 12 in.
E. 13 in.

2. What is the volume of a spherical water balloon with a radius of 6 inches?

A. $48\pi$ in$^3$
B. $144\pi$ in$^3$
C. $288\pi$ in$^3$
D. $864\pi$ in$^3$

3. Penny built a wooden ramp that rose 9 inches over a horizontal distance of 29 inches, as shown below.

What is the length, to the nearest whole inch, of the ramp's inclined side?

4. What is the length of $\overline{XY}$?

Calculator Allowed For 2, 3 & 4
5. What is the distance between the two points plotted below?

6. Which of the following is the best approximation of the volume of the cylinder below?

Use \( \pi \) for \( \pi \).

A. \( 2411.5 \text{ cm}^3 \)
B. \( 602.9 \text{ cm}^3 \)
C. \( 226.1 \text{ cm}^3 \)
D. \( 150.7 \text{ cm}^3 \)

7. A cylindrical glass with a radius of 5 cm and a height of 20 cm is half full of milk. How many milliliters of milk are in the glass? (1 cm\(^3\) = 1 ml) Disregard the thickness of the glass when finding your answer.

A. \( 50\pi \text{ ml} \)
B. \( 100\pi \text{ ml} \)
C. \( 250\pi \text{ ml} \)
D. \( 500\pi \text{ ml} \)
This scatter plot shows the relationship between the average weight and average heart rate for 11 different animals.

Select True or False for each statement based on the scatter plot.

A. There is a positive association between the average weight and average heart rate for animals.

B. Animals with higher body weights tend to have lower heart rates than animals with lower body weights.

C. For animals weighing 20 lbs or less, there is a linear association between average weight and average heart rate.

Which of the following lines would be the best fit for the data points plotted in the scatter plot below?

A. \( y = -7.2x + 0.7 \)
B. \( y = -0.7x + 7.2 \)
C. \( y = 0.7x + 7.2 \)
D. \( y = 7.2x + 0.7 \)

*Calculator Allowed for 2*
Clint and Kate have been working to improve their skills at the local archery range. After each round, they try to increase the difficulty by increasing the distance between themselves and the target by 1 yard. Clint has plotted his data in the scatter plot shown.

**Shooting Distance and Number of Hits**

Which statement is true about Clint's scatter plot?

A. There is a nonlinear association between the shooting distance and number of hits; as the shooting distance increases, the number of hits decreases.

B. There is a negative linear association between the shooting distance and number of hits; as the shooting distance increases, the number of hits decreases.

C. There is a positive linear association between the shooting distance and number of hits; as the shooting distance increases, the number of hits increases.

D. There is a negative linear association between the shooting distance and number of hits; as the shooting distance increases, the number of hits increases.

The relationship between two quantitative variables is being investigated with a scatter plot. Which of these statements is true when using a straight line to model the relationship?

A. Even if the straight line doesn't pass through any of the points in the scatter plot, it is definitely a good fit.

B. If the straight line doesn't pass through any of the points in the scatter plot, it is definitely not a good fit.

C. If the straight line passes through all the points in the scatter plot, it is definitely a good fit.

D. Even if the straight line passes through all the points in the scatter plot, it is definitely not a good fit.

A survey found that the relationship between the years of education a person has and that person's yearly income in his or her first job after completing schooling can be modeled by the equation \( y = 1200x + 7000 \), where \( x \) is the number of years of education and \( y \) is the yearly income. According to the model, how much does 1 year of education add to a person's yearly income?

A. $1200

B. $5800

C. $7000

D. $8200

The relationship between a person's age and the monthly cost to cover that person with a certain life insurance policy can be modeled by the equation \( y = 0.5x + 10 \), where \( x \) is the person's age and \( y \) is the monthly cost in dollars. Which of these statements is true according to the model?

A. It costs $20 a month to cover a 40-year-old.

B. It costs $30 a month to cover a 40-year-old.

C. It costs $40 a month to cover a 20-year-old.

D. It costs $40 a month to cover a 30-year-old.
7 The two-way frequency table below shows the number of attendees at a music camp whose primary instrument is string, wind, brass, and percussion. Which of these statements is true based on the table?

<table>
<thead>
<tr>
<th></th>
<th>String</th>
<th>Wind</th>
<th>Brass</th>
<th>Percussion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8</td>
<td>9</td>
<td>4</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>14</td>
<td>5</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>23</td>
<td>9</td>
<td>11</td>
<td>53</td>
</tr>
</tbody>
</table>

A. Those who play a wind instrument tend to be male.
B. Those who play a string instrument tend to be male.
C. Those who are female tend to play a brass instrument.
D. Those who are female tend to play a percussion instrument.

8 The two-way frequency table below shows the relative frequencies for the numbers of wins and losses that a professional baseball team had while playing at home and away.

<table>
<thead>
<tr>
<th></th>
<th>Home</th>
<th>Away</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>( \frac{5}{18} )</td>
<td>( \frac{1}{6} )</td>
<td>( \frac{4}{9} )</td>
</tr>
<tr>
<td>Losses</td>
<td>( \frac{2}{9} )</td>
<td>( \frac{1}{3} )</td>
<td>( \frac{5}{9} )</td>
</tr>
<tr>
<td>Total</td>
<td>( \frac{1}{2} )</td>
<td>( \frac{1}{2} )</td>
<td>1</td>
</tr>
</tbody>
</table>

Which of these statements are true based on the table? Select two that apply.

A. \( \frac{5}{8} \) of the team's wins came while playing at home
B. \( \frac{2}{3} \) of the team's losses came while playing away
C. \( \frac{2}{5} \) of the team's home games were losses
D. \( \frac{1}{3} \) of the team's away games were wins