

Practice Round

1. Solve for the equation  $k$ .  $3k - 11 = 4k + 7$ . Write your answer in the blank next to number 1 on the official answer sheet.
  
2. Let  $k$  be the answer to number 1. If  $k$  is the slope of a line that passes through the origin, what is the  $y$ -coordinate on the line at the point  $(-2, y)$ ? Write your answer in the blank next to number 2 on the official answer sheet.
  
3. Let  $k$  be the answer to number 2. If  $k$  is the area of a square, what is the perimeter of the square? Write your answer in the blank next to number 3 on the official answer sheet.
  
4. Let  $k$  be the answer to number 3. What is the greatest common factor of 84 and  $k$ ? Write your answer in the blank next to number 4 on the official answer sheet.
  
5. Let  $k$  be the answer to number 4. If  $k$  is the diameter of a circle, what is the area of the circle? Round your answer to the nearest whole number. Write your answer in the blank next to number 5 on the official answer sheet.
  
6. Let  $k$  be the answer to number 5.  $k$  is a prime number. Find the next larger prime number. Write your answer in the blank next to number 6 on the official answer sheet. ( $\pi \approx 3.14$ )

-18

36

24

12

113

127

Round 1

1. What is the slope of the line formed by the equation  $10x - 2y = 17$ ? Write your answer in the blank next to number 1 on the official answer sheet.
  
2. Let  $k$  be the answer to number 1. Solve the equation for  $x$ :  $3(k - x) + 7 = 2k$ . Write your answer in the blank next to number 2 on the official answer sheet.
  
3. Let  $k$  be the answer to number 2. Evaluate  $\sqrt{\frac{k^2}{2} + (k - 2)^3}$ . Write your answer in the blank next to number 3 on the official answer sheet.
  
4. Let  $k$  be the answer to number 3. Evaluate  $\frac{k^2}{4} + \frac{(k - 2)^2}{2} + \frac{k^2}{8}$ . Write your answer in the blank next to number 4 on the official answer sheet.
  
5. Let  $k$  be the answer to number 4.  
What is the  $k^{\text{th}}$  number in the sequence  $-1, 1, 3, 5, \dots$ ?  
Write your answer in the blank next to number 5 on the official answer sheet.
  
6. Let  $k$  be the answer to number 5. Find  $\frac{(k^2 - 2k - 8)(k^2 - 5k)}{(k^2 - 9k + 20)(k^2 + 4k + 4)}$ . Write your answer as a fraction in lowest terms in the blank next to number 6 on the official answer sheet.

5

4

4

8

13

$\frac{13}{15}$

## Round 2

1. What positive integer produces the same result when the number is added to itself or the number is multiplied by itself? Write your answer in the blank next to number 1 on the official answer sheet.
  
  
  
  
  
  
  
  
  
  
2. Let  $k$  be the answer to number 1. Raise  $k$  to the 5<sup>th</sup> power and then find the first prime number larger than  $k^5$ . Write your answer in the blank next to number 2 on the official answer sheet.
  
  
  
  
  
  
  
  
  
  
3. Let  $k$  be the answer to number 2. What is the quotient when the sum of  $k+1$ ,  $k+3$ , and  $k+5$  is divided by 6? Write your answer in the blank next to number 3 on the official answer sheet.
  
  
  
  
  
  
  
  
  
  
4. Let  $k$  be the answer to number 3. What is the least common multiple of  $k$  and 45? Write your answer in the blank next to number 4 on the official answer sheet.
  
  
  
  
  
  
  
  
  
  
5. Let  $k$  be the answer to number 4. How many different prime numbers are factors of  $k$ ? (note: 1 is not a prime number) Write your answer in the blank next to number 5 on the official answer sheet.
  
  
  
  
  
  
  
  
  
  
6. Let  $k$  be the answer to number 5. What digit is in the one's place of  $k^{21}$ ? Write your answer in the blank next to number 6 on the official answer sheet.

2

37

20

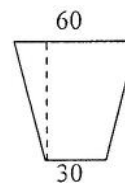
180

3

3

Round 3

1. What is the sum of the angle measures in an isosceles triangle? Write your answer in the blank next to number 1 on the official answer sheet.
  
2. Let  $k$  be the answer to number 1. If  $k$  is the width of a rectangle and  $k + 60$  is the length of the rectangle, what is the length of the diagonal of the rectangle? Write your answer in the blank next to number 2 on the official answer sheet.
  
3. Let  $k$  be the answer to number 2. Consider a pentagon with side lengths,  $x$ ,  $x+5$ ,  $x+10$ ,  $x+15$ , and  $x+20$ . If  $k$  is the perimeter of this pentagon, what is the length of longest side? Write your answer in the blank next to number 3 on the official answer sheet.
  
4. Let  $k$  be the answer to number 3. If  $k$  is the area of a rectangle where the length is 9 more than the width, what is the length? Write your answer in the blank next to number 4 on the official answer sheet.
  
5. Let  $k$  be the answer to number 4. If  $k$  is the height of the isosceles trapezoid shown in the figure, what is the area of the trapezoid? Write your answer in the blank next to number 5 on the official answer sheet.



180

300

70

14

630

200