1. What is the only positive solution to $3x^2 + 17x = 28$?  
   ____4/3_____

2. What is the ones digit of $2017^{2015}$?  
   ____3_____

3. [Note: In this problem, $i = \sqrt{-1}$.] $(15 + i)(15 - i) = $  
   ___226____

4. A cone of radius $r$ and height $h$ has a volume equal to that of a right circular cylinder having the same height. What is the radius of the right circular cylinder?  
   ___$r \sqrt{3}$_____ 

5. A palindromic number is one whose digits read the same backward and forward, for example 484 or 909. Which of the following prime numbers is a factor of every four-digit palindromic number? (choose one)  
   a. 3  b. 7  c. 11  d. 13  e. There is no such prime number  
   (Ans: c)

6. How many solutions are there to the equation $\cos 2x - \sin x = 1$, for $0 \leq x < 2\pi$ (x in radians)?  
   _____4______

7. Which of the following is closest to $1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1}}}}}$ (circle one)?  
   a. $\frac{1 + \sqrt{3}}{2}$  b. $\sqrt{2}$  c. $\frac{1 + \sqrt{5}}{2}$  d. $\sqrt{\pi}$  e. $\frac{2\pi}{3}$  
   (Ans: c)

8. A right triangle has legs $a$ and $b$, hypotenuse $c$, and perimeter $2d$. Find $\sqrt{d(d - a)(d - b)(d - c)}$.  
   _____ab/2_______

9. A perfect number is a number greater than 1 that is equal to the sum of its proper factors/divisors (including the factor 1, but not including the number itself). Example: $6 = 1 + 2 + 3$. How many perfect numbers are less than 10,000?  
   ____4____

10. Which of the following is largest (circle one)?  
   a. $2016^{2016}$  b. $2016!$  c. $20^{(16^{20})}$  d. $16^{(20^{20})}$  e. $20^{(20^{16})}$  
   (Ans: d)

Thank you for participating.