

1. ABCDE is a regular pentagon with F at its center. How many different triangles can be formed by joining 3 of the points A,B,C,D,E and F?  
 (A) 10  
 (B) 15  
 (C) 20  
 (D) 25  
 (E) 30
2. The function  $f$  is defined for all positive integers  $n$  by the following rule:  $f(n)$  is the number of positive integers each of which is less than  $n$  and has no positive factor in common with  $n$  other than 1. If  $p$  is prime, then  $f(p) =$   
 (A)  $P-1$   
 (B)  $P-2$   
 (C)  $(P+1)/2$   
 (D)  $(P-1)/2$   
 (E) 2
3. How many numbers that are not divisible by 6 divide evenly into 264,600?  
 (A) 9  
 (B) 36  
 (C) 51  
 (D) 63  
 (E) 72
4. A certain quantity is measured on two different scales, the R-scale and the S-scale, that are related linearly. Measurements on the R-scale of 6 and 24 correspond to measurements on the S-scale of 30 and 60, respectively. What measurement on the R-scale corresponds to a measurement of 100 on the S-scale?  
 (A) 20  
 (B) 36  
 (C) 48  
 (D) 60  
 (E) 84
5. Mrs. Smith has been given film vouchers. Each voucher allows the holder to see a film without charge. She decides to distribute them among her four nephews so that each nephew gets at least two vouchers. How many vouchers has Mrs. Smith been given if there are 120 ways that she could distribute the vouchers?  
 (A) 13  
 (B) 14  
 (C) 15  
 (D) 16  
 (E) more than 16
6. This year Henry will save a certain amount of his income, and he will spend the rest. Next year Henry will have no income, but for each dollar that he saves this year, he will have  $1 + r$  dollars available to spend. In terms of  $r$ , what fraction of his income should Henry save this year so that next year the amount he was available to spend will be equal to half the amount that he spends this year?  
 (A)  $1/(r+2)$   
 (B)  $1/(2r+2)$   
 (C)  $1/(3r+2)$   
 (D)  $1/(r+3)$   
 (E)  $1/(2r+3)$
7. Before being simplified, the instructions for computing income tax in Country R were to add 2 percent of one's annual income to the average (arithmetic mean) of 100 units of Country R's currency and 1 percent of one's annual income. Which of the following represents the simplified formula for computing the income tax in Country R's currency, for a person in that country whose annual income is  $I$ ?  
 (A)  $50 + I/200$   
 (B)  $50 + 3I/100$   
 (C)  $50 + I/40$   
 (D)  $100 + I/50$   
 (E)  $100 + 3I/100$
8. How many positive integers less than 10,000 are such that the product of their digits is 210?  
 (A) 24  
 (B) 30  
 (C) 48  
 (D) 54  
 (E) 72

9. Find the number of selections that can be made taking 4 letters from the word "ENTRANCE".

- (A) 70
- (B) 36
- (C) 35
- (D) 72
- (E) 32

Find in the above word, the number of arrangements using the 4 letters.

10. How many triangles with positive area can be drawn on the coordinate plane such that the vertices have integer coordinates  $(x,y)$  satisfying  $1 \leq x \leq 3$  and  $1 \leq y \leq 3$ ?

- (A) 72
- (B) 76
- (C) 78
- (D) 80
- (E) 84