Name_____

PERENNIAL MATH
January 2015 Intermediate Level
TEST #3

1) What is the least natural number that has three different prime factors?	
2) Jenny was ordering cans of waffle mix and they costs $5.19 per can or a 3-pack costs $13.57. She ordered 16 cans and paid $9.99 shipping. She calculated to find the least expensive way to order and paid with a $100 gift card. How many dollars are left on the gift card if you round the amount to the nearest dollar?	
3) A palindrome is a number that reads the same forwards and backward such as 121. How many palindromes are there between 125 and 521?	
4) There are 3 drawers in the office file cabinet. The number of files in the second drawer equals the sum of the number of files in the top and bottom drawers combined. Donna takes 8 files from the top drawer and puts them on the desk. She also takes 4 files from the bottom drawer and puts them in the second drawer and then takes 6 files from the second drawer and puts them in the top drawer. How many more files are now in the second drawer than in the top and bottom drawers combined?	
5) In this cryptarithm, different letters stand for different digits. There are several solutions for this problem. What is the largest number that ACD can be? $\begin{array}{r} B\,A \\ +\ B\,A \\ \hline A\,C\,D \end{array}$	
6) In a class of 28 students, 15 like chocolate ice cream and 18 like vanilla ice cream. However, 3 students do not like these flavors. How many students in the class like both chocolate and vanilla?	

1) What is the least natural number that has three different prime factors?	**30**
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3) A palindrome is a number that reads the same forwards and backward such as 121. How many palindromes are there between 125 and 521?	**39**
4) There are 3 drawers in the office file cabinet. The number of files in the second drawer equals the sum of the number of files in the top and bottom drawers combined. Donna takes 8 files from the top drawer and puts them on the desk. She also takes 4 files from the bottom drawer and puts them in the second drawer and then takes 6 files from the second drawer and puts them in the top drawer. How many more files are now in the second drawer than in the top and bottom drawers combined?	**4**
5) In this cryptarithm, different letters stand for different digits. There are several solutions for this problem. What is the largest number that ACD can be? B A + B A A C D	**182**
6) In a class of 28 students, 15 like chocolate ice cream and 18 like vanilla ice cream. However, 3 students do not like these flavors. How many students in the class like both chocolate and vanilla?	**8**

1) The least natural number that has three different prime factors can be solved by listing the first three prime numbers and multiplying: 2 x 3 x 5 = 30

30

2) The least amount Jenny can spend is 5 times the 3-pack plus one additional can for the $5.19. So 5 x $13.57 = $67.85 + $5.19 = $73.04. Add the shipping $73.04 + 9.99 = $83.03. If the bill is paid with a $100 gift card, then $100 - $83.03 leaves $16.97 on the gift card. This number rounded up is $17

$17

3) Make an organized list of palindromes between 125 and 521. There are 7 that begin with 1, and 10 each that begin with 2, 3, and 4. And finally there are 2 that begin with 5. So, there are 39 palindromes between 125 and 521.

131	202	303	404	505
141	212	313	414	515
151	222	323	424	**2**
161	232	333	434	
171	242	343	444	
181	252	353	454	
191	262	363	464	
7	272	373	474	
	282	383	484	
	292	393	494	
	10	**10**	**10**	

39

4) When 8 files are removed from the top drawer, then there are 8 more in the second drawer than the top and bottom combined. When 4 are taken from the bottom drawer and put in the second drawer (a net change of 8) there are now 16 more in the second drawer than the top and bottom. When 6 are taken from the second drawer and placed in the top drawer (a net change of 12), there are now 4 more in the second cabinet than in the top and bottom.

- 8

+4

- 4

+6

- 6

4
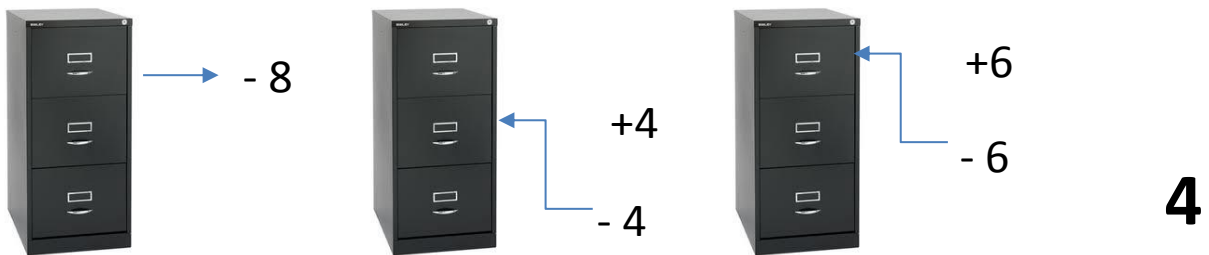
5) There are several possibilities for this cryptarithm. However, A must be 1 or 2 since it is the result of a carry on the addition of the B+B. Some of the possible solutions are 102, 142, 162, and 182. The answer is 182 since it is the largest possible sum.

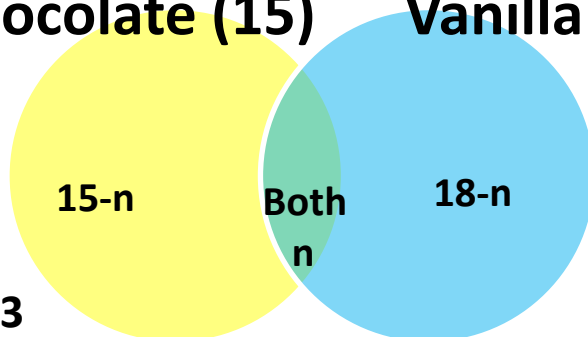$$\begin{array}{r} B\,A \\ +\ B\,A \\ \hline A\,C\,D \end{array}$$

182

6) Use algebra. Let n represent the region for both flavors.

$$28 = (15 - n) + (18 - n) + 3 + n$$
$$28 = 36 - n$$
$$n = 8$$

Chocolate (15)   Vanilla (18)

15-n   Both   18-n
        n

Neither = 3

8