Name_____

PERENNIAL MATH

TEST # 1

November 2015 Intermediate Level

1) What single number should be placed in both boxes?

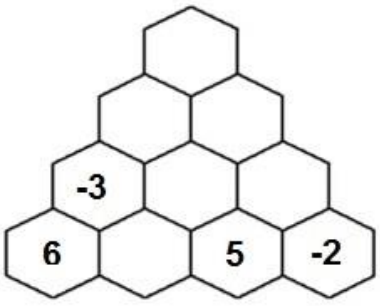
$$30 - \square = 22 + \square$$

2) Rachel has twice as much money as Kim. Kim has two dimes and two nickels. Rachel only has quarters and nickels and has the same number of each coin. If they trade all their money in for only nickels, how many nickels would they have together?

3) Milo spent half of his weekly allowance for a movie ticket. His parents let him wash the car for $15 to earn more money. How much is his weekly allowance if he ended with $24?

4) A palindrome is a number that reads the same forwards or backwards. 2002 is a palindrome. What is the sum of the closest palindrome before 2002 and the closest palindrome after 2002?

5) Each hexagon is made by adding the 2 numbers in the hexagons below it. Complete the puzzle. Take the number of the top hexagon and add 20 to it, what value do you get?

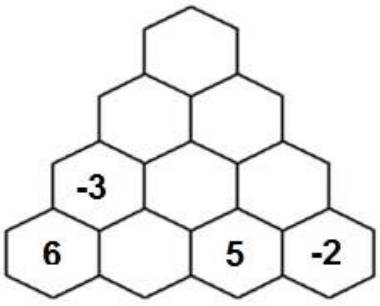


6) For each of the numbers: 41, 53, and 82, the tens digit is greater in value than the ones digit. How many 2-digit numbers have this property, but exclude a 6 in either digit?

PERENNIAL MATH

TEST # 1

November 2015 Intermediate Level Answers

1) What single number should be placed in both boxes? $30 - \square = 22 + \square$	**4**
2) Rachel has twice as much money as Kim. Kim has two dimes and two nickels. Rachel only has quarters and nickels and has the same number of each coin. If they trade all their money in for only nickels, how many nickels would they have together?	**18**
3) Milo spent half of his weekly allowance for a movie ticket. His parents let him wash the car for $15 to earn more money. How much is his weekly allowance if he ended with $24?	**$18**
4) A palindrome is a number that reads the same forwards or backwards. 2002 is a palindrome. What is the sum of the closest palindrome before 2002 and the closest palindrome after 2002?	**4103**
5) Each hexagon is made by adding the 2 numbers in the hexagons below it. Complete the puzzle. Take the number of the top hexagon and add 20 to it, what value do you get? 	**12**
6) For each of the numbers: 41, 53, and 82, the tens digit is greater in value than the ones digit. How many 2-digit numbers have this property, but exclude a 6 in either digit?	**36**

PERENNIAL MATH

TEST # 1

November 2015 Intermediate Level Solutions

We are only providing some suggested solutions below. There are always multiple methods to solve problems.

1) The missing number is 4. Both sides are equal to 26.

$$30 - \boxed{4} = 22 + \boxed{4}$$

4

2) Since Rachel has twice as much money as Kim and Kim has two dimes and two nickels (30 cents), then Rachel has to have 60 cents. Rachel only has quarters and nickels and has the same number of each coin, so she must have 2 quarters and 2 nickels. They trade all their money in for only nickels, so they have 90 cents altogether and that is 18 nickels.

18

3) Milo spent half of his weekly allowance for a movie ticket. His parents let him wash the car for $15 to earn more money. He ended up with $24. Work backwards.

$24 – $15 = $9

$9 x 2 = $18

His weekly allowance is $18.

$18

PERENNIAL MATH

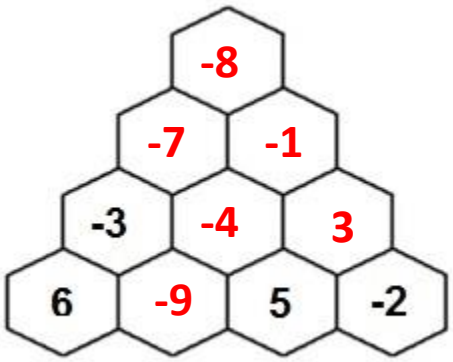
TEST # 1

November 2015 Intermediate Level Solutions

4) The sum of the closest palindrome before 2002 and the closest palindrome after 2002 is: 1991 + 2112 = 4103.

4103

5) If you complete the puzzle, -8 is in the top hexagon. -8 + 20 = 12



12

6) If we begin to list the numbers in groups: 10; 20,21; 30,31,32; 40,41,42,43; ... ; 90,91,92,93,94,95,96,97,98. We can see that the total number of 2-digit numbers, for which the ones digit is greater than the tens digit, will be 1 + 2 + ... + 9 = 45. Now subtract the nine 2-digit numbers that have a 6 in either digit. 45 – 9 = 36 numbers.

10								
20	21							
30	31	32						
40	41	42	43					
50	51	52	53	54				
60	61	62	63	64	65			
70	71	72	73	74	75	76		
80	81	82	83	84	85	86	87	
90	91	92	93	94	95	96	97	98

36