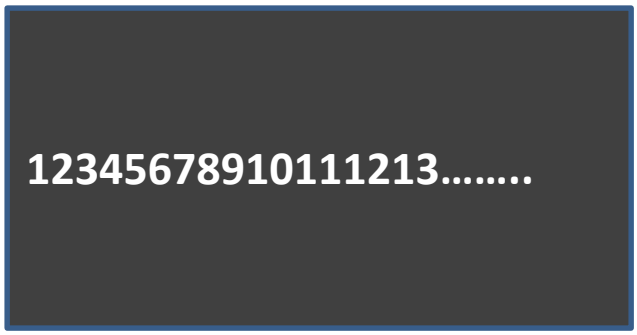
Name_____

PERENNIAL MATH

TEST #4

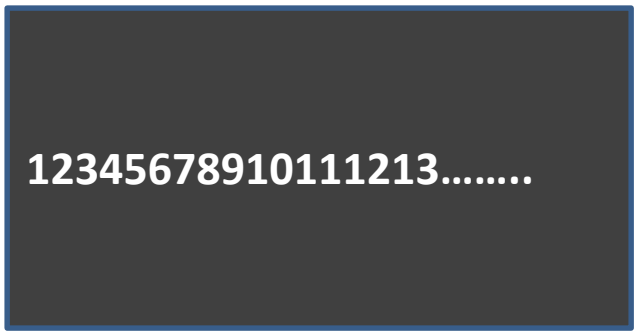
February 2015 Intermediate Level

1) One natural number is 3 times larger than another natural number. The product of the two numbers is 27. What is the sum of the two numbers?	
2) Vince is thinking of a four-digit number. The first average of the first two digits is 5. The average of the last two digits is 3. The average of the first and last digit is 4. What is the greatest number he could have been thinking of?	
3) How many numbers between 100 and 300 are divisible by both 3 and 5?	
4) Parents donated chocolate for the school fund raiser. Forty pounds of milk chocolate sold for $2.15 per pound and dark chocolate sold for $1.90 per pound. The class made $158.20. How many total pounds of chocolate were sold?	
5) The counting numbers are written across the board in order. There is room for 50 digits across and there are no spaces between each digit. John writes two rows of digits. What is the last digit in the second row? 	
6) How many rectangles can be made whose sides are even whole numbers and they have a perimeter of 64 cm?	

PERENNIAL MATH

TEST # 4

February 2015 Intermediate Level Answers

1) One natural number is 3 times larger than another natural number. The product of the two numbers is 27. What is the sum of the two numbers?	12
2) Vince is thinking of a four-digit number. The first average of the first two digits is 5. The average of the last two digits is 3. The average of the first and last digit is 4. What is the greatest number he could have been thinking of?	8260
3) How many numbers between 100 and 300 are divisible by both 3 and 5?	13
4) Parents donated chocolate for the school fund raiser. Forty pounds of milk chocolate sold for $2.15 per pound and dark chocolate sold for $1.90 per pound. The class made $158.20. How many total pounds of chocolate were sold?	78
5) The counting numbers are written across the board in order. There is room for 50 digits across and there are no spaces between each digit. John writes two rows of digits. What is the last digit in the second row? 	5
6) How many rectangles can be made whose sides are even whole numbers and they have a perimeter of 64 cm?	8

PERENNIAL MATH

TEST # 4

February 2015 Intermediate Level Solutions

1) The numbers 3 and 9 produce 27 when multiplied and 9 is also 3 times bigger than 3. The sum of the two numbers is 9 + 3 = 12

12

2) Since the average of the first two digits is five, the sum of the digits must add up to 10 - that leaves numbers of (1, 9), (2, 8), (3, 7), or (4, 6).
The average of the last two digits is 3, so the sum of the digits must add up to 6 - that leaves possible numbers of (1, 5), or (2, 4).
If the average of the first and last digit is four, then the sum of the digits must add up to 8 - that leaves possible numbers of (0,8), (1, 7), (2, 6), or (3, 5).
The greatest number possible can be found by choosing the highest numbers in the possible lists (0,8).
8_ _ 0 since 8 is the highest number in the averages of first and last numbers. If 8 is the first number then, 2 is the next number because the average of the first two numbers is 5.
82_0 Since 0 is the last number the third number must be 6 because the average of the last two digits is 3.
The number is 8260.

8260

3) The first number between 100 and 300 that is divisible by both 3 and 5 is 105. The least common multiple of 3 and 5 is 15. So add every 15^{th} number past 105. The numbers are: 105, 120, 135, 150, 165, 180, 195, 210, 225, 240, 255, 270, 285. Do not count 300 because it says between 300. There are 13 numbers that are between 100 and 300 are divisible by both 3 and 5.

13

PERENNIAL MATH

TEST # 4

February 2015 Intermediate Level Solutions

4) Forty pounds of milk chocolate sold for $2.15 per pound so that was a total of $86. The class made a total of $158.20 altogether. So subtract the milk chocolate total to find out how much money was made from the dark chocolate. $158.20 - $86 = $72.20. Divide to find out how many pounds of dark chocolate were sold. $72.20/$1.90 = 38. 40 lbs. of milk chocolate + 38 lbs. of dark chocolate = 78 total lbs. of chocolate sold.

78

5) You could list the numbers out:
123456789101112131415161718192021222324252627282930
31323334353637383940414243444546474849505152535455.
The last number on the second row is 5.

Or you could calculate that the first 9 counting numbers is 9 digits, then all the rest of the counting numbers are 2-digit. So 100 digits in both rows minus the first 9 numbers is 91 digits. Divide 91 in half and that is 45.5 The numbers 10-19, 20-29, 30-39, 40-49 are 20 digits each. So the counting number 1-49 equals 89 digits. Eleven digits further would land you on 5, the beginning digit of the number 55.

5

6) Make a chart of the rectangles that can be made with dimensions that yield a perimeter of 64 cm, count only the ones with even numbers. There are 8 rectangles that have even dimensions.

Length	Width
31	1
30	2
29	3
28	4
27	5
26	6
25	7
24	8
23	9
22	10
21	11
20	12
19	13
18	14
17	15
16	16

8