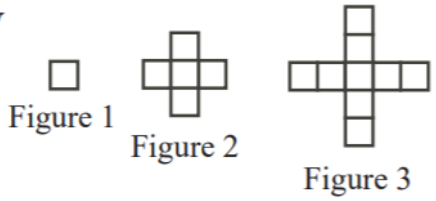
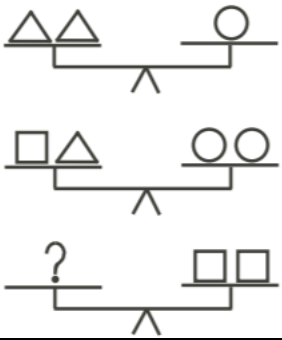
Name:_____ Date:_____

Math 8H HW Ch 2 Challenging Algebra Problems

1	If a is an even integer and b is an odd integer, which of the following could represent an odd integer? **(A)** ab **(B)** $a+2b$ **(C)** $2a-2b$ **(D)** $a+b+1$ **(E)** $a-b$
2	In the sequence shown, each figure after the first is formed by adding 4 squares to the previous figure. How many squares form Figure 2010? **(A)** 8037 **(B)** 8040 **(C)** 8043 **(D)** 6030 **(E)** 6026  Figure 1 Figure 2 Figure 3
3	The 8 people at a party shook hands exactly once with each of the others before the ninth person arrived. The ninth person then shook hands with some of these 8 people. A total of 32 handshakes took place. With how many people did the ninth person shake hands? **(A)** 3 **(B)** 4 **(C)** 5 **(D)** 6 **(E)** 7
4	Nick charges \$7 for travel costs and then \$10 per hour for babysitting. Which expression always represents the number of dollars that Nick charges for y hours of babysitting? **(A)** $10y+7$ **(B)** $y+7$ **(C)** $17y-7$ **(D)** $10y-7$ **(E)** $17y$
5	In any triangle, the length of the longest side is less than half of the perimeter. All triangles with perimeter 57 and integer side lengths x, y, z, such that $x<y<z$ are constructed. How many such triangles are there? **(A)** 68 **(B)** 61 **(C)** 75 **(D)** 56 **(E)** 27
6	The list of integers $4, 4, x, y, 13$ has been arranged from least to greatest. How many different possible ordered pairs (x, y) are there so that the average (mean) of these 5 integers is itself an integer? **(A)** 7 **(B)** 8 **(C)** 9 **(D)** 10 **(E)** 11
7	All three scales shown are balanced. One possible replacement for the ? is **(A)** ○△ **(B)** ○△△ **(C)** ○○△ **(D)** ○○△△ **(E)** ○○○△ 

8	Pete is given three *positive* integers and is told to add the first two, and then multiply the result by the third. Instead, he multiplies the first two and adds the third to that result. Surprisingly, he still gets the correct answer of 14. How many different values could the first number have been? **(A)** 5 **(B)** 4 **(C)** 6 **(D)** 3 **(E)** 7
9	A list of six positive integers p, q, r, s, t, u satisfies $p < q < r < s < t < u$. There are exactly 15 pairs of numbers that can be formed by choosing two different numbers from this list. The sums of these 15 pairs of numbers are: $25, 30, 38, 41, 49, 52, 54, 63, 68, 76, 79, 90, 95, 103, 117.$ Which sum equals $r + s$? **(A)** 52 **(B)** 54 **(C)** 63 **(D)** 68 **(E)** 76
10	In a sequence of 10 terms, the first term is 1, the second term is x, and each term after the second is the sum of the previous two terms. For example, if $x = 11$, the sequence would be $1, 11, 12, 23, 35, 58, 93, 151, 244, 395$. For some values of x, the number 463 appears in the sequence. If x is a positive integer, what is the sum of all the values of x for which 463 appears in the sequence? **(A)** 1156 **(B)** 1296 **(C)** 1248 **(D)** 1528 **(E)** 1283