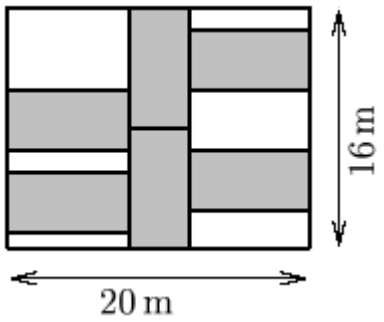
PIMS Elementary Grades Math Competition NAME: _____
30 April 2011
Target Round - Grade Seven Division SCHOOL: _____

1. The sides of the large rectangle are 20m and 16m. All 6 shaded rectangles have the same shape and area (in square metres). What is the total area, in square metres, of all the shaded regions?



_____(m) 1

2. In a contest to guess the number of coins in a jar, Amy guessed 43, Ben guessed 51, and Carl guessed 61. The average of two of the guesses was correct and each guess was off by an odd number. What is the largest number of coins that could have been in the jar? _____ 2

3. Alicia weighs 75 kg (kilograms) and plans to lose 8 kg as follows: every week she will lose 150 gm (grams) except that every 10-th week she will gain 640 gm. For example, if all goes according to her plan, she will have lost 0.6 kg after 4 weeks, and she will have lost 0.71 kg after 10 weeks. After how many weeks will she reach her goal? _____(weeks) 3

4. The following multiplication uses all of the digits 0 to 9, once each. What is the value of E?
$A2B \times C3 = 5DE01$. _____ 4

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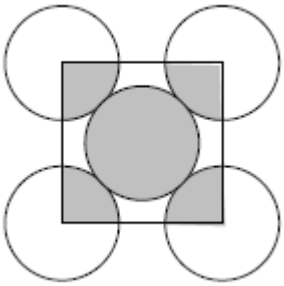
5. All 5 circles have the same radius.
The combined area of the shaded regions is 128π.
What is the area of the square?



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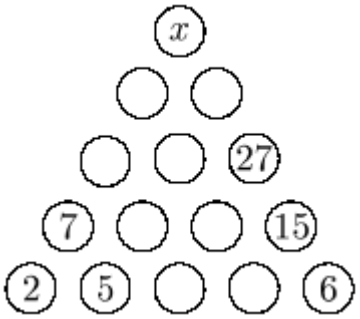
6. What is the sum of all the positive factors of 100?
Note: 1 and 100 are factors of 100. _____ 6

7. The number in each circle is the sum of the numbers in the two circles immediately below the circle. What is the value of x?



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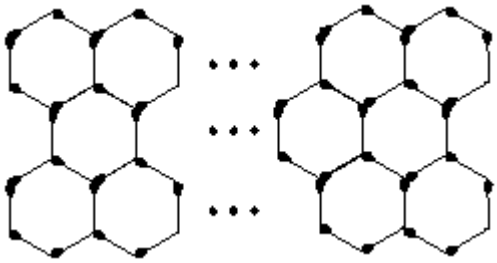
8. The pattern consists of three rows of hexagons where the top and the bottom rows both have 20 hexagons and the middle row has 19 hexagons. A single match is used to construct a side of each of the hexagons, and if two hexagons share a side, then a single match is used for that shared side. How many matches were used in total?



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9. What is the largest whole number N such that $N^3 < 2011$?

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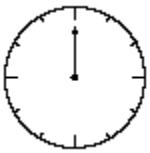
10. A 12-hour clock shows that it is exactly 12:00.
What time shows on the clock 2011 minutes later?
Express your answer in hours and minutes.
For example, an answer of 3:16 is of the right format.



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11. The digit sum of 32 is a multiple of 5 and so is the digit sum of 46.
How many positive numbers smaller than 100 either have a digit sum which is multiple of 5, or contain the digit 5?
Note: the numbers 5, 32, 46, 50, 53, 75, and 78 satisfy the condition, while the numbers 6, 20, and 49 do not.

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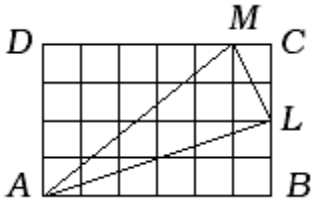
12. $ABCD$ is a rectangle and each of the small squares has side 1.
What is the length of the largest side of triangle ALM ?
Express your answer in simplest radical form.



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