# Po Leung Kuk
7th Primary Mathematics World Contest

# Problems for Individual Contest

1. There are four kinds of dollar-note (or dollar-bills) of value $1, $5, $10 and $50 respectively. There is a total of nine dollar-nptes, with at least one dollar-note of each kind. If the total value of these dollar notes is $177, how many $10 dollar-notes are there?

2. In figure, **MN** is a straight line.
    The angles *a, b* and *c* satisfy the
    relations, *b:a*=2:1 and *c:b*=3:1.
    Find angle *b*.
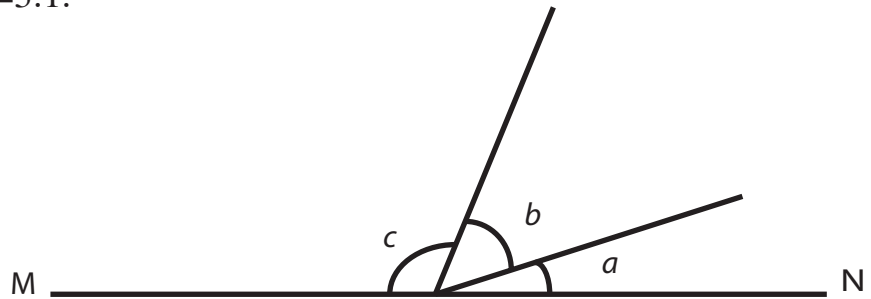
3. A square floor is tiled with congruent square tiles. The tiles on the two diagonals of the floor are black. The rest of the tiles are white. If there are 101 black tiles, what is the total number of white tiles?
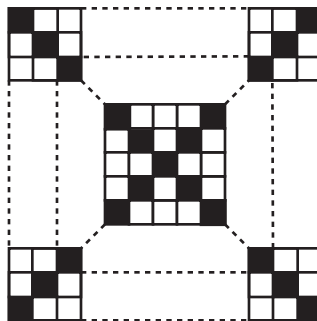
4. Find the value of

    $$\frac{1}{2} + \left(\frac{1}{3} + \frac{2}{3} \right) + \left(\frac{1}{4} + \frac{2}{4} + \frac{3}{4} \right) + \left(\frac{1}{5} + \frac{2}{5} + \frac{3}{5} + \frac{4}{5} \right) + \ldots + \left(\frac{1}{100} + \frac{2}{100} + \ldots + \frac{99}{100} \right)$$

5. Two bulbs flash at regular intervals of 30 seconds and 36 seconds. Both bulbs flash together for the 1st time at 10:45 a.m. At what time will they flash together for the 13th time?

6.   In trapezoid **ABCD**, segments **AB** and **CD** are both perpendicular to **BC**. Diagonals **AC** and **BD** intersect at **E**. If **AB** = 9, **BC** = 12 and **CD** = 16, what is the area of triangle **BEC**?
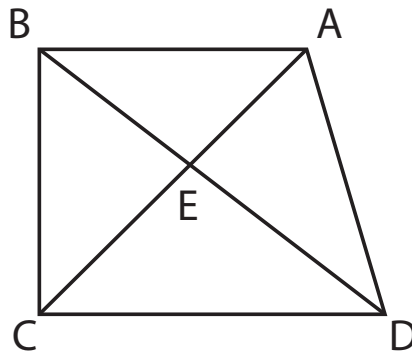

7.   Peter begins counting up from 100 by 7's (100, 107,...) and Mary begins counting down from 1000 by 8's (1000, 992,...) at the same time. If they count at the same rate, what number will they say at the same time?

8.   In a party, there are n persons. If everyone shakes hands once with each other person and there are a total of 231 handshakes, what is the value of n?

9.   A bus starts from town **A** to town **B** and another bus starts from town **B** to town **A** on the same road. They run with constant speed to their destinations and back hom without stopping. The buses pass by each other fro the firdt time at 700 km (kilometers) from town **A** and they pass each other for the second time on the way back at 400km from town **B**. How many km is it from town **A** to town **B**?

10.   Refer to the diagram below. In rectangle ABCD, F is the midpoint of AB, BC = 3BE, AD = 4HD. If the area of rectangle ABCD is 300 square units, how many square units is the area of the shaded region?
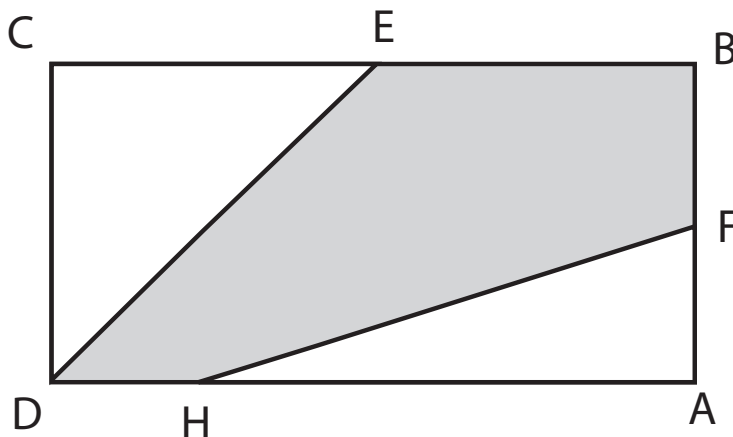
11. A contractor requests 2 men to build brick walls. One man can build a brick wall in 9 hours, while the other man can do the same job in 10 hours. However, when the two men work together, there will be a shortfall of a total of 10 bricks per hour, and it takes them exactly 5 hours to complete the brick wall. Find the total number of bricks used on the wall.

12. Clock A is ten seconds faster than standard time every hour. CLock B is twenty seconds slower than the standard time every hour. If we adjust the two clocks to standard time at the same time, then within 24 hours clock A shows 7:00 while clock B shows 6:50. What is the standard time at that moment?

13. Find the fraction with the smallest denominator between $\dfrac{97}{36}$ and $\dfrac{96}{35}$.

14. I, II and III are three semi circles of different sizes. If the ratio of the diameters of I, II, and III is 3:4:5, and the area of III is 24 cm^2, how many cm^2 is the sume of the areas of I and II?
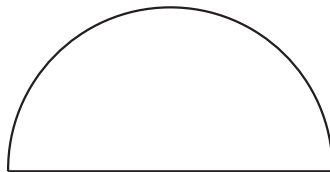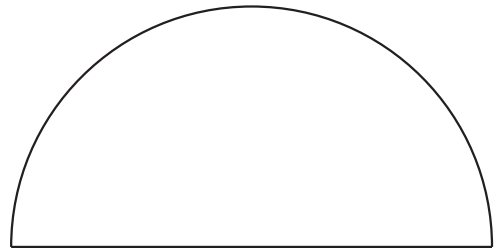
I   II   III

15. How many different isosceles triangles of perimeter 25 units can be formed where each side is a whole number (integer) of units?