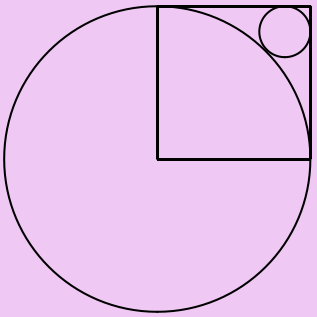
Secondary 1 (GRADE 7) SAMPLE PAPER

Q1 The square in the figure has side length equal to 1. What is the radius of the small circle?



A. $\frac{1}{3}$

B. $\frac{1}{4}$

C. $\frac{1}{5}$

D. $\frac{1}{6}$

E. None of the above

Q2 A two-digit number formed by any 2 adjacent digits of a 2017-digit number is divisible by 17 or 23. If the last digit of the 2017-digit number is 1, find the first digit.

A. 2

B. 3

C. 4

D. 6

E. 9

Q3 If $a_1 + a_2 = 1$, $a_2 + a_3 = 2$, $a_3 + a_4 = 3$, $a_4 + a_5 = 4$, $\ldots a_{50} + a_{51} = 50$ and $a_{51} + a_1 = 51$, then what is the sum of $a_1, a_2, a_3, \ldots, a_{51}$?

A. 663

B. 1326

C. 1076

D. 538

E. 665

Q4 The solution set of $\frac{x}{a} + \frac{1}{b} > 0$ is $x < \frac{1}{3}$, where a and b are constants. Determine the solution set of $bx - a > 0$.

A. $x > \frac{1}{3}$

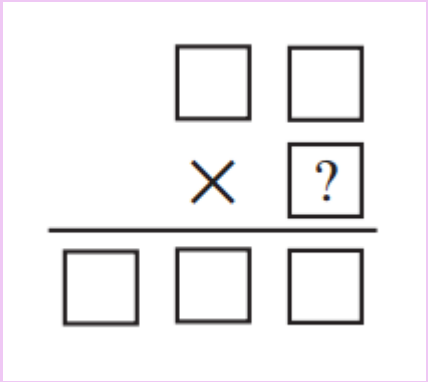
B. $x < -\frac{1}{3}$

C. $x > -\frac{1}{3}$

D. $x < \frac{1}{3}$

E. None of the above

Q5 The digits 1, 2, 3, 4, 5, and 6 are each placed in one of the boxes so that the multiplication below is correct. The digit represented by "?" is _____.



A. 2
B. 3
C. 4
D. 5
E. 6

Q6 You are asked to move several boxes. You know nothing about the boxes except that each box weighs no more than 10 tons and their total weight is 100 tons. You can rent several trucks, each of which can carry no more than 30 tons. What is the minimum number of trucks you can rent to to ensure that all the boxes can be carried at once?

Q7 On the island of Nevermind, some people are liars who always lie. The remaining habitants of the island are truthlovers who tell only the truth. Three habitants of the island, A, B, and C met this morning.

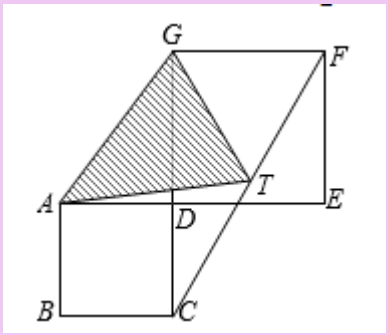
A said: "All of us are liars".

B said: "Only one of us is a truthlover".

Who is the truthlover?

(Write 0001 if the answer is A; or 0002 if the answer is B; or 0003 if the answer is C; or 0004 if none of them)

Q8 Given two squares ABCD and DEFG with sides 6 cm and 8 cm, respectively. Let T be the midpoint of line segment CF. Find the area of triangle ATG.



Q9 Solve the following equation

$$x + \frac{x}{1+2} + \frac{x}{1+2+3} + \cdots \frac{x}{1+2+3+\cdots+2017} = 2017.$$

Q10 In the picture below, triangles ABC and CDE have the same areas. Let F be the point of intersection of AC and DE. It is known that AB is parallel to DE. AB = 9 cm and DF = 7.5 cm. Find the length of EF in cm.