

الجامعة الإسلامية العالمية ماليزيا

**INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA**

# **IIUM Mathematics Competition (IMC 2014)**

## **MULTIPLE CHOICE QUESTIONS**

**This Question Paper Consists of 6 Printed Pages with 20 Questions**

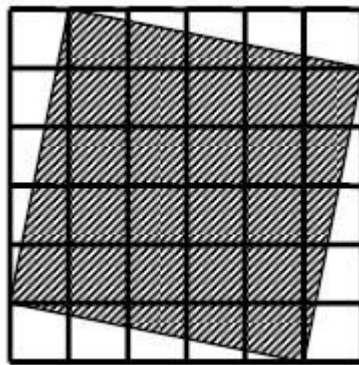
**Department of Computational and Theoretical Sciences  
Kulliyyah of Science**

1. What are the last 5 digits of the sum

$$3 + 33 + 333 + \dots + \underbrace{333\dots3}_{2014}$$

- (A) 03033      (B) 03032      (C) 03031      (D) 13032      (E) 13033

2. What is the ratio of the shaded square to that of the largest square shown in the diagram?



- (A) 13:18      (B) 13:16      (C) 11:18      (D) 11:16      (E) 11:15

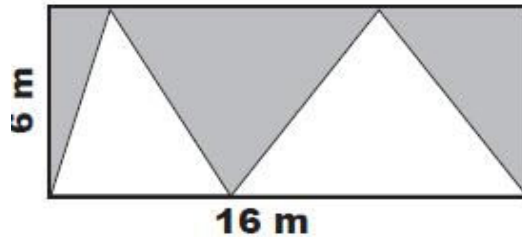
3. The digits 3, 4, 5 and 7 can form twenty four different four digit numbers. Find the average of these twenty four numbers

- (A) 4537.50      (B) 5867.75      (C) 5277.25      (D) 3548.35      (E) 3876.45

4. A piece of pasture grows at a constant rate every day. 200 sheep will eat up the grass in 100 days. 150 sheep will eat up the grass in 150 days. How many days does it take for 100 sheep to eat up the grass?

- (A) 325      (B) 250      (C) 350      (D) 200      (E) 300

5. What is the area, in square meters, of the shaded part of the rectangle?



- (A) 40                      (B) 96                      (C) 56                      (D) 48                      (E) 74

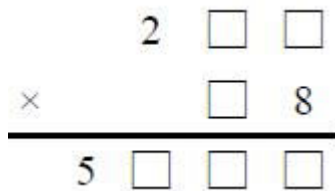
6. The squares on a mat are arranged in the following order color pattern; blue, green, red, yellow, brown, purple. If the mat has 64 squares, what is the greatest number of blue squares the mat will have?

- (A) 12                      (B) 10                      (C) 11                      (D) 9                      (E) 13

7. For  $x \neq y$  one has that  $\frac{3}{x} + 8y = \frac{3}{y} + 8x$ . Then compute the product  $xy$

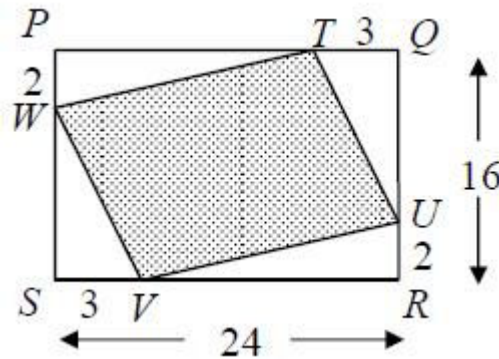
- (A) -3                      (B) 7                      (C) -21                      (D)  $\frac{8}{3}$                       (E)  $-\frac{3}{8}$

8. In the multiplication example below, all number from 1 through 9 have been used once, and once only. Three of the numbers are given. What is the three digit number on top?



- (A) 297                      (B) 279                      (C) 246                      (D) 264                      (E) 293

9. The rectangle PQRS measures 24 cm by 16 cm. Points T, U, V and W are on the sides with measurements, in centimeters, as shown. Find the area, in square centimeters, of shaded portion.

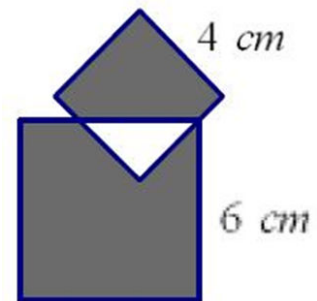


- (A) 360                      (B) 340                      (C) 320                      (D) 300                      (E) 280

10. The average of 10 consecutive odd numbers is 120. What is the average of the 5 largest numbers?

- (A) 135                      (B) 125                      (C) 115                      (D) 105                      (E) 100

11. Two squares, with lengths 4 cm and 6 cm respectively, are partially overlapped as shown in the diagram above. What is the difference between shaded area of the small square and shaded area of the big square?



- (A) 16                      (B) 20                      (C) 26                      (D) 28                      (E) 30

12. How many digits are there before the hundredth 9 in the following number

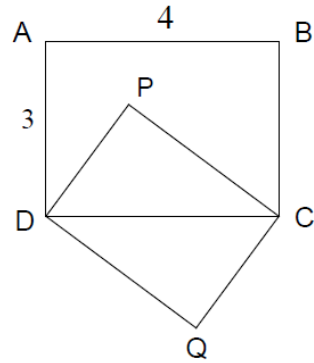
97977977797777977779777779.....

- (A) 5145                      (B) 5534                      (C) 5273                      (D) 4059                      (E) 5049

13. What is the smallest positive integer  $n$  such that  $\sqrt{n} - \sqrt{n-1} < \frac{1}{60}$

- (A) 801                      (B) 901                      (C) 1001                      (D) 2001                      (E) 2011

14. A rectangle ABCD has sides of length 3 and 4. A rectangle PCQD is similar to rectangle ABCD, with P inside rectangle ABCD. Compute the distance from P to AB.



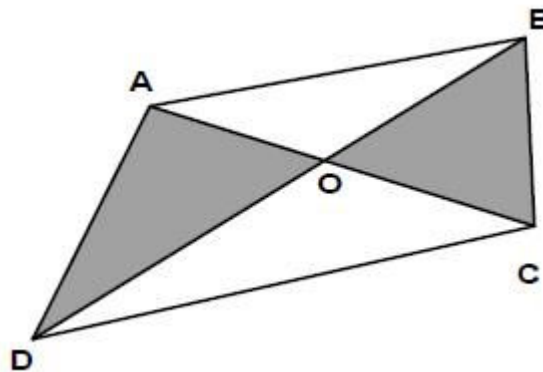
- (A) 1                      (B)  $\frac{4}{3}$                       (C)  $\frac{27}{25}$                       (D)  $\frac{21}{17}$                       (E)  $\frac{7}{5}$

15. Evaluate

$$\frac{1}{1+\sqrt{2}+\sqrt{3}} + \frac{1}{1-\sqrt{2}+\sqrt{3}} + \frac{1}{1+\sqrt{2}-\sqrt{3}} + \frac{1}{1-\sqrt{2}-\sqrt{3}}$$

- (A) 1                      (B) -1                      (C) -2                      (D) 2                      (E) 3

16. Lines AC and BD meet at point O. Given that OA = 40 cm, OB = 50 cm, OC = 60 cm and OD = 75 cm, find the ratio of the area of triangle AOD to the area of triangle BOC.



- (A) 3:1                      (B) 1:3                      (C) 2:1                      (D) 1:2                      (E) 1:1

17. At the Hari Merdeka parade, the local scout troop found that they could arrange themselves in rows of exactly 3, exactly 4, or exactly 5, with no one left over. What is the least number of scouts in the troop?

- (A) 60                      (B) 120                      (C) 100                      (D) 36                      (E) 45

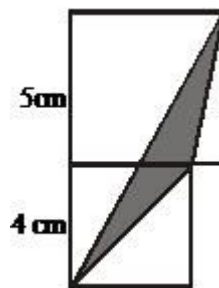
18. How many two-digit numbers have the property of being equal to 7 times the sum of their digits?

- (A) 7                      (B) 6                      (C) 5                      (D) 4                      (E) 3

19. What is the last digit of  $2013^{2014}$ ?

- (A) 1                      (B) 9                      (C) 7                      (D) 3                      (E) 5

20. The figure is made up of two squares of sides 5 cm and 4 cm respectively. Find the shaded area.



- (A) 7                      (B) 7.5                      (C) 8                      (D) 8.5                      (E) 9

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