



# PEPONI

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## SCHOOL

### 2025 VI Form Scholarship Examinations

Write your name here

Surname	Other names
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## Mathematics 2

**Time: 1 hour**

**You must have:** Pen, HB pencil, eraser, calculator.

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions on the answer sheet.
- **Calculators may be used. Paper for your working will be provided.**
- The total mark for this paper is 142
- Correct answers to questions 1 to 10 will be awarded 5 marks each. Correct answers to questions 11 to 20 will be awarded 6 marks each. Correct answers to questions 21 to 24 will be awarded 8 marks each. Guessing is discouraged and 2 marks will be awarded for each unanswered question up to a maximum of 20 marks.

1. The expression  $2 \times 0 + 1 - 9$  equals  
 (A)  $-8$       (B)  $-6$       (C)  $-7$       (D)  $-11$       (E)  $0$

2. The value of  $\frac{5^2 - 9}{5 - 3}$  is  
 (A)  $4$       (B)  $2$       (C)  $\frac{1}{2}$       (D)  $8$       (E)  $-2$

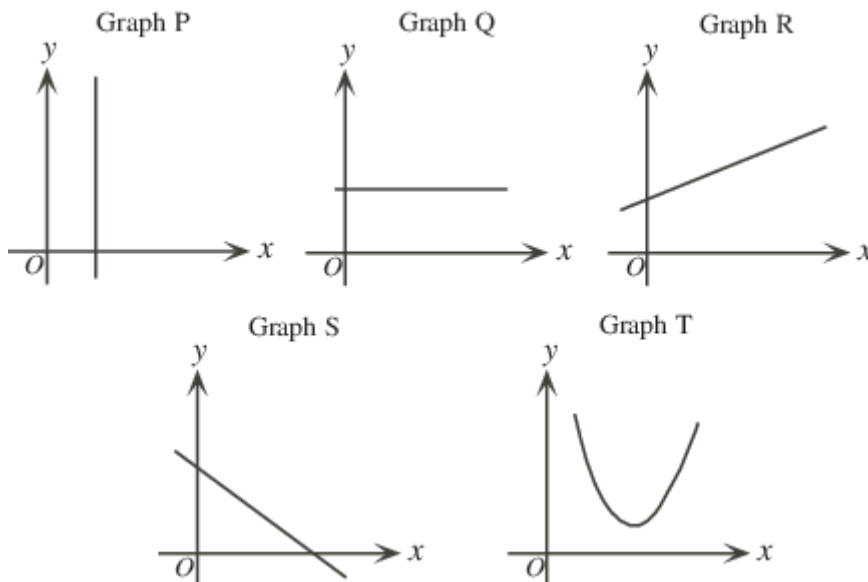
3. A snowman is built by stacking three spheres with their centres aligned vertically. The spheres have radii of 10 cm, 20 cm and 30 cm. How tall is the snowman?  
 (A) **90 cm**      (B) **100 cm**      (C) **110 cm**  
 (D) **120 cm**      (E) **130 cm**



4. If  $\sqrt{5 + n} = 7$ , the value of  $n$  is  
 (A)  $4$       (B)  $9$       (C)  $24$       (D)  $44$       (E)  $74$

5. A rectangle has a length of  $\frac{3}{5}$  and an area of  $\frac{1}{3}$ . What is the width of the rectangle?  
 (A)  $\frac{1}{5}$       (B)  $\frac{5}{9}$       (C)  $\frac{14}{15}$       (D)  $\frac{15}{14}$       (E)  $\frac{9}{5}$

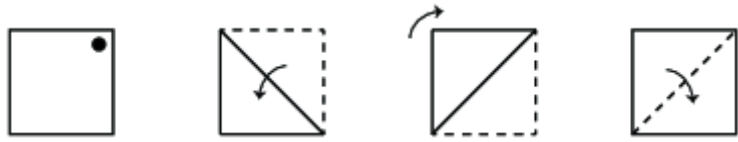
6. Which of the five graphs is linear with a slope of  $0$ ?




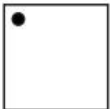
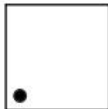
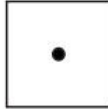
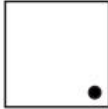
- (A) Graph P      (B) Graph Q      (C) Graph R      (D) Graph S      (E) Graph T

7. The average of the two positive integers  $m$  and  $n$  is 5. What is the largest possible value for  $n$ ?  
 (A)  $5$       (B)  $7$       (C)  $9$       (D)  $11$       (E)  $13$

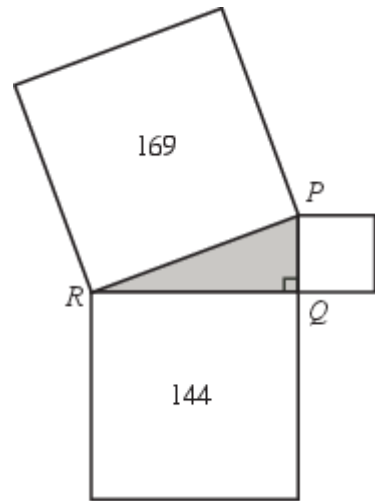
8. A square piece of paper has a dot in its top right corner and is lying on a table. The square is folded along its diagonal, then rotated  $90^\circ$  clockwise about its centre, and then finally unfolded, as shown.



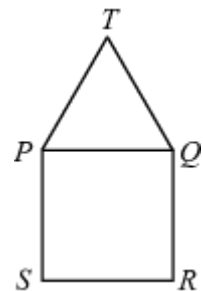
The resulting figure is

- (A)  (B)  (C)  (D)  (E) 

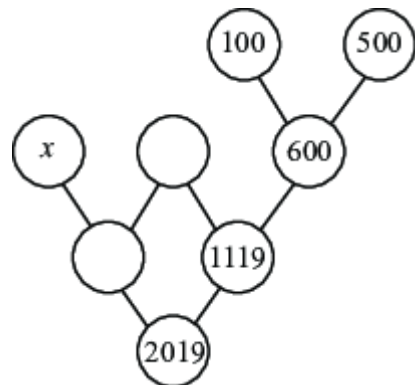
9. In the diagram,  $\triangle PQR$  has a right angle at  $Q$ . A square is drawn on each side of the triangle. The area of the square on side  $QR$  is 144. The area of the square on side  $PR$  is 169. What is the area of the square on side  $PQ$ ?
- (A) 16 (B) 12 (C) 13  
(D) 36 (E) 25



10. In the diagram, pentagon  $TPSRQ$  is constructed from equilateral  $\triangle PTQ$  and square  $PQRS$ . The measure of  $\angle STR$  is equal to
- (A)  $10^\circ$  (B)  $15^\circ$  (C)  $20^\circ$   
(D)  $30^\circ$  (E)  $45^\circ$

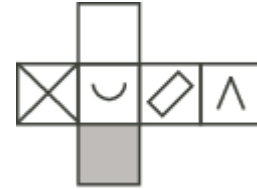


11. In the diagram, numbers are to be placed in the circles so that each circle that is connected to two circles above it will contain the sum of the numbers contained in the two circles above it. What is the value of  $x$ ?
- (A) 481 (B) 381 (C) 281  
(D) 581 (E) 681



12. Alejandro has a box that contains 30 balls, numbered from 1 to 30. He randomly selects a ball from the box where each ball is equally likely to be chosen. Which of the following is most likely?
- (A) He selects a ball whose number is a multiple of 10.  
 (B) He selects a ball whose number is odd.  
 (C) He selects a ball whose number includes the digit 3.  
 (D) He selects a ball whose number is a multiple of 5.  
 (E) He selects a ball whose number includes the digit 2.

13. The diagram shows a piece of cardboard that can be folded to make a cube. The cardboard has designs on one side only. Which one of the following cubes can be made from this cardboard?



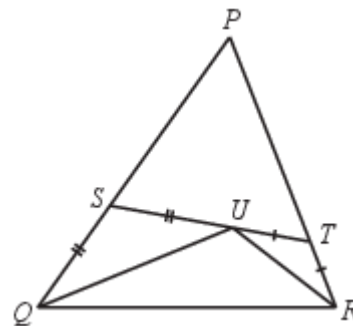
- (A) (B) (C)   
 (D) (E)

14. If  $\frac{3}{x-3} + \frac{5}{2x-6} = \frac{11}{2}$ , then the value of  $2x - 6$  is  
 (A) 2 (B) 12 (C) 6 (D) 8 (E) 10
15. The points  $Q(1, -1)$ ,  $R(-1, 0)$  and  $S(0, 1)$  are three vertices of a parallelogram. The coordinates of the fourth vertex of the parallelogram could be  
 (A)  $(-2, 2)$  (B)  $(0, -1)$  (C)  $(0, 0)$  (D)  $(\frac{3}{2}, \frac{1}{2})$  (E)  $(-1, 1)$
16. The equation  $y = ax^2 + bx + c$  was used to create the table of values below:

$x$	0	1
$y$	8	9

What is the value of  $a + b$ ?

- (A) -2 (B) 1 (C) 3 (D) 5 (E) -5
17. In the diagram,  $PQ = 19$ ,  $QR = 18$ , and  $PR = 17$ . Point  $S$  is on  $PQ$ , point  $T$  is on  $PR$ , and point  $U$  is on  $ST$  so that  $QS = SU$  and  $UT = TR$ . The perimeter of  $\triangle PST$  is equal to  
 (A) 36 (B) 35 (C) 37  
 (D) 34 (E) 38



18. When 100 is divided by 12, the remainder is 4. When 100 is divided by a positive integer  $x$ , the remainder is 10. When 1000 is divided by  $x$ , the remainder is  
 (A) 10 (B) 100 (C) 0 (D) 1 (E) 90
19. A multiple choice test has 10 questions on it. Each question answered correctly is worth 5 points, each unanswered question is worth 1 point, and each question answered incorrectly is worth 0 points. How many of the integers between 30 and 50, inclusive, are **not** possible total scores?  
 (A) 2 (B) 3 (C) 4 (D) 6 (E) 5

20. There are  $n$  students in the math club at Scoins Secondary School. When Mrs. Fryer tries to put the  $n$  students in groups of 4, there is one group with fewer than 4 students, but all of the other groups are complete. When she tries to put the  $n$  students in groups of 3, there are 3 more complete groups than there were with groups of 4, and there is again exactly one group that is not complete. When she tries to put the  $n$  students in groups of 2, there are 5 more complete groups than there were with groups of 3, and there is again exactly one group that is not complete. The sum of the digits of the integer equal to  $n^2 - n$  is  
 (A) **11**            (B) **12**            (C) **20**            (D) **13**            (E) **10**
21. In Yacleyland, the unit of money used is called the Yacley. There are only two denominations of paper money: the 17 Yacley bill and the 5 Yacley bill. How many different combinations of these bills total 453 Yacley?  
 (A) **3**            (B) **4**            (C) **5**            (D) **6**            (E) **7**
22. Seven friends are riding the bus to school:
- Cha and Bai are on 2 different buses.
  - Bai, Abu and Don are on 3 different buses.
  - Don, Gia and Fan are on 3 different buses.
  - Abu, Eva and Bai are on 3 different buses.
  - Gia and Eva are on 2 different buses.
  - Fan, Cha and Gia are on 3 different buses.
  - Cha and Eva are on 2 different buses.
- What is the least possible number of buses on which the friends could be riding?  
 (A) **3**            (B) **4**            (C) **5**            (D) **6**            (E) **7**
23. Suppose that  $PQRSTUWV$  is a regular octagon. (A *regular octagon* is an octagon with eight equal side lengths and eight equal interior angles.) There are 70 ways in which four of its sides can be chosen at random. If four of its sides are chosen at random and each of these sides is extended infinitely in both directions, what is the probability that they will meet to form a quadrilateral that contains the octagon?  
 (A)  $\frac{1}{2}$             (B)  $\frac{19}{35}$             (C)  $\frac{37}{70}$             (D)  $\frac{17}{35}$             (E)  $\frac{18}{35}$
24. The number 8 is the sum and product of the numbers in the collection of four positive integers  $\{1, 1, 2, 4\}$ , since  $1 + 1 + 2 + 4 = 8$  and  $1 \times 1 \times 2 \times 4 = 8$ . The number 2007 can be made up from a collection of  $n$  positive integers that multiply to 2007 and add to 2007. What is the smallest value of  $n$  with  $n > 1$ ?  
 (A) **1171**            (B) **1337**            (C) **1551**            (D) **1777**            (E) **1781**