

2022-2023 Junior Mathematical Olympiad

Round One Examination (Grades 5 and 6) - 1:00pm

For each question, determine the letter corresponding to the correct or best response; along with the question number, indicate this letter by shading it on the answer sheet

1. What is the value of

$$20 + 2 \times 3?$$

- (A) 26 (B) 2026 (C) 66 (D) 2023 (E) 25

2. The grid below gives the position of different shapes. The ♠ is at $B4$.

	1	2	3	4
A		♥		
B				♠
C		◇	★	
D	♣			

On which square is the ★?

- (A) $A3$ (B) $C3$ (C) $D4$ (D) $B4$ (E) $C2$

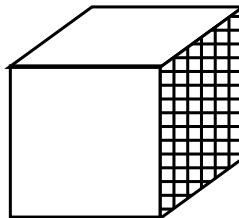
3. Which of the following numbers is closest to zero?

- (A) 0.03 (B) 0.048 (C) 0.009 (D) 0.005 (E) 0.02

4. A passenger aircraft has 3 seats on each side of a centre aisle in each row. It is designed to carry 150 passengers. How many rows of seats does the aircraft have?

- (A) 50 (B) 37 (C) 33 (D) 32 (E) 25

5. How many edges does a cube have?

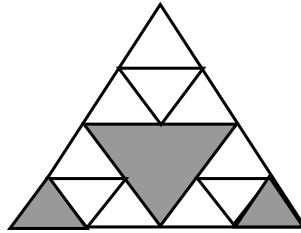


- (A) 4 (B) 6 (C) 8 (D) 10 (E) 12

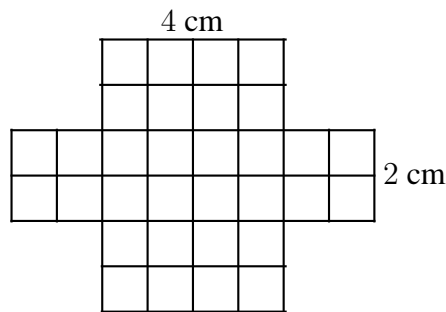
6. What is the difference between the largest 5-digit number and the smallest 5-digit number which can be formed from rearranging the 5 digits below?

3, 4, 1, 5, 2

- (A) 41,967 (B) 41,976 (C) 44,444 (D) 42,024 (E) 41,076
7. In a family, each of the children have at least one brother and at least two sisters. What is the smallest number of children in this family?
- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
8. What fraction of the largest triangle is shaded?



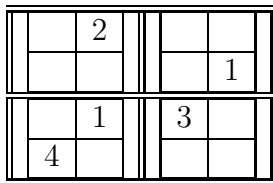
- (A) $1/2$ (B) $1/3$ (C) $1/4$ (D) $7/16$ (E) $3/8$
9. The diagram shows a net for an open top box. It is to be filled with 1 cm cubes.



How many cubes will the box (neatly) hold?

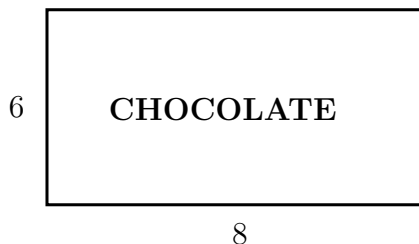
- (A) 6 (B) 12 (C) 16 (D) 24 (E) 32

10. The game of **Magic Fours** is played on a 4×4 grid. When completed, each of the numbers 1, 2, 3 and 4 occurs in each row and column of the 4×4 grid and also in each 2×2 corner of the grid.



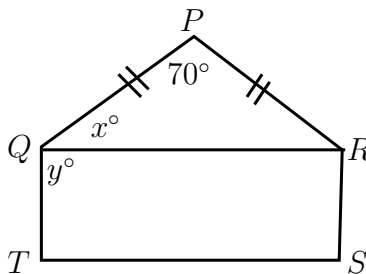
When the grid shown is completed, the sum of the four numbers in the corners of the 4×4 grid is

- (A) 13 (B) 11 (C) 15 (D) 12 (E) 10
11. Janae is given a large block of chocolate which is made up of square pieces and is 6 pieces wide and 8 pieces long.



She eats all the outer pieces. What fraction of the block is left?

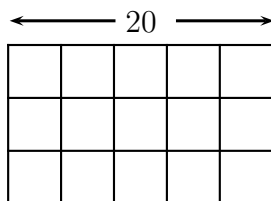
- (A) $1/4$ (B) $1/3$ (C) $1/2$ (D) $2/3$ (E) $3/4$
12. In the diagram, triangle PQR is isosceles with $PQ = PR$, and $QRST$ is a rectangle. Also, $\angle QPR = 70^\circ$, $\angle PQR = x^\circ$, and $\angle RQT = y^\circ$.



The value of $y - x$ is

- (A) 25 (B) 35 (C) 45 (D) 55 (E) 65

13. Beatrice gives a number problem to Harry. She told him to choose a number, add 5 to it, double that sum and then subtract 10. Harry's answer was 30. Which number did he choose?
(A) 15 (B) 25 (C) 45 (D) 40 (E) 30
14. A rectangular wire grid is made up of 15 equal squares as shown.

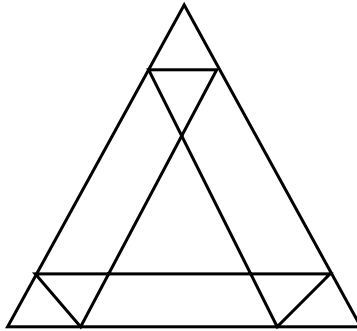


- If the length of the grid is 20 cm, what is the total length, in centimetres, of the wire in the grid?
(A) 144 (B) 150 (C) 152 (D) 164 (E) 170
15. When I opened my new math book the sum of the two page numbers facing me was 317. What will be the number on the next page?
(A) 167 (B) 160 (C) 155 (D) 164 (E) 318
16. Jacqui has \$510 which is made up of \$5, \$10, \$20 and \$50 bills. She has an equal number of each type of bill. How many bills does she have?
(A) 24 (B) 20 (C) 16 (D) 22 (E) 18
17. In the number sentence below, three of the digits are missing, and are represented by \square , \blacksquare and ∇ .
- $$\square 2 \blacksquare - 76 = 3 \Delta 7$$
- If the number sentence is correct, what is the value of $\square + \blacksquare + \nabla$?
(A) 7 (B) 8 (C) 10 (D) 11 (E) 17
18. At the supermarket, a regular packet of chips is 75 g. A packet of chips on special is advertised at one-third extra. How many grams does the special packet have?
(A) 50 (B) 78 (C) 100 (D) 125 (E) 150

19. Each of Andrew, Bill, Clair, Daniel and Eva either always lies or is always truthful, and they know who each of them is.
- Andrew says that Bill is a liar.
 - Bill says that Clair is a liar.
 - Clair says that Daniel is a liar.
 - Daniel says that Eva is a liar.

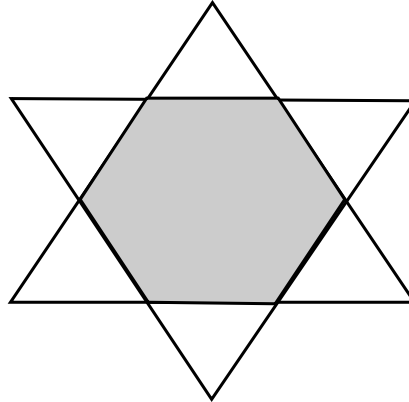
What is the largest possible number of liars in the group?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5
20. How many triangles are in the following picture?



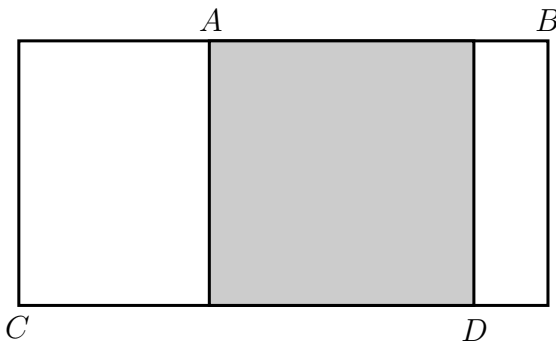
- (A) 9 (B) 10 (C) 13 (D) 14 (E) 17
21. A bus leaves a bus stop at 10 : 35 am and then stops at 4 other bus stops. If neighbouring stops are 10 minutes apart and the bus remains at each stop for 3 minutes, at what time does the bus arrive at the last stop?
- (A) 11 : 11 am (B) 11 : 14 am (C) 11 : 21 am (D) 11 : 24 am (E) 11 : 27 am
22. A muffin recipe which makes 12 muffins requires $\frac{2}{3}$ of a cup of milk. How many muffins can be made using 18 cups of milk?
- (A) 90 (B) 108 (C) 144 (D) 216 (E) 324

23. Two identical equilateral triangles, each with an area equal to 36 cm^2 , are placed one on top of the other so that the overlap forms a regular hexagon.



What is the area of the hexagon?

- (A) 18 cm^2 (B) 20 cm^2 (C) 24 cm^2 (D) 30 cm^2 (E) 36 cm^2
24. In my marble bag there are between 40 and 80 marbles. If I share them equally among 4 children there is 1 left. If I share them equally among 5 children there are 3 left. If I share them equally among 6 children there is 1 left. How many marbles do I have?
- (A) 41 (B) 53 (C) 63 (D) 68 (E) 73
25. There is a shaded square inside a rectangle as shown. From A to B is 6 cm and from C to D is 8 cm. What is the perimeter of the large rectangle?



- (A) 28 cm (B) 27 cm (C) 26 cm (D) 25 cm (E) 24 cm