

AMC - 2003

JUNIOR DIVISION

Questions 1 - 10, 3 marks each

1. $3004 - 2003$ equals

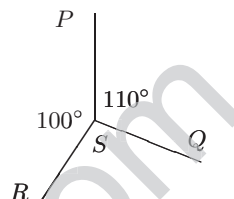
- (A) 999 (B) 991 (C) 1001 (D) 2001 (E) 2003

2. Which of the following is closest to 9?

- (A) 9.2 (B) 8.17 (C) 8.7 (D) 9.21 (E) 8.71

3. The size of $\angle RSQ$, in degrees, is

- (A) 120 (B) 130 (C) 140
(D) 150 (E) 160



4. The temperature at Cooma rose from 7°C yesterday morning to 15°C yesterday afternoon. The number of degrees the temperature rose was

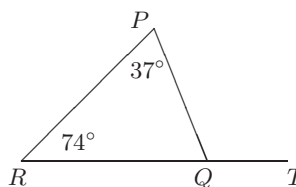
- (A) 5 (B) 7 (C) 8 (D) 10 (E) 12

5. Which of the following is equal to 50?

- (A) $15 + (10 \times 2)$ (B) $100 \div 5$ (C) $2 \times (5 \times 10)$
(D) $(20 + 80) \div 10$ (E) $200 \div 4$

6. In the diagram, the size of $\angle PQT$, in degrees, is

- (A) 74 (B) 107 (C) 111
(D) 101 (E) 121



7. $\frac{2003}{20.03}$ equals

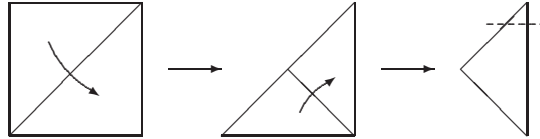
- (A) 0.01 (B) 100 (C) 0.1 (D) 1 (E) 10

J2

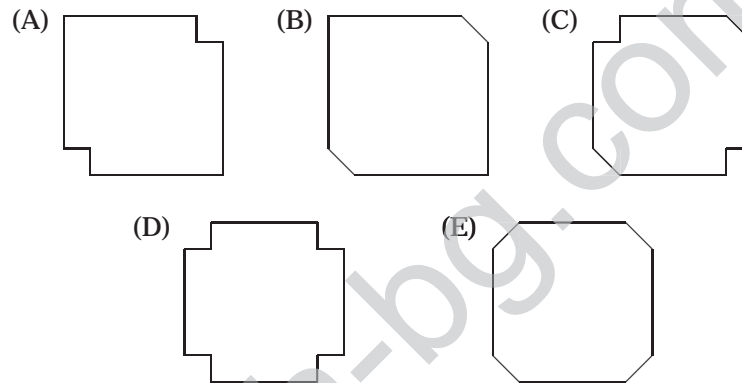
8. The smallest number that 4, 5 and 7 will divide into is

- (A) 70 (B) 140 (C) 210 (D) 280 (E) 1400

9. A square piece of paper is folded along the diagonals twice as shown.



A cut is made along the dotted line in the third diagram to remove the corner. When the paper is unfolded, which of the following diagrams shows how the paper appears?



10. If $\frac{1}{4}$ of a number is 6, then $\frac{3}{8}$ of this number is

- (A) 6 (B) 8 (C) 9 (D) 12 (E) 15

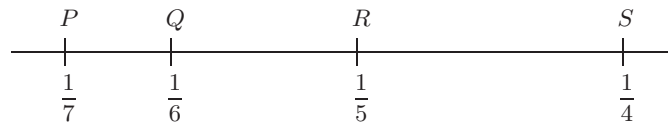
Questions 11 - 20, 4 marks each

11. Schoolteacher Mr Jones drove 54 kilometres from his house in the country to the school. If the trip takes him 45 minutes, what is his average speed in kilometres per hour?

- (A) 72 (B) 60 (C) 48 (D) 75 (E) 84

J3

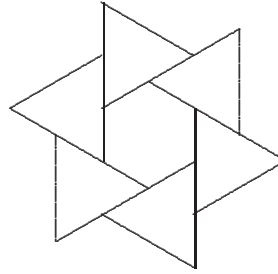
12. On the number line below, where would 0.12 be placed?



- (A) To the right of S (B) Between R and S (C) Between Q and R
 (D) Between P and Q (E) To the left of P
13. When George recently visited Latvia, one Latvian *lat* was worth \$US1.50, while \$A1 was worth \$US0.60. In this case, a Latvian *lat* was worth
- (A) \$A1.80 (B) \$A2.50 (C) \$A2.75 (D) \$A2.00 (E) \$A3.00
14. If $\frac{n}{24}$ lies between $\frac{1}{6}$ and $\frac{1}{4}$ and n is an integer, then n equals
- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9
15. If S is the sum of the remainders when each of the numbers 30, 31, 32, 33, 34 and 35 is divided by 6, then what is the remainder when S is divided by 6?
- (A) 0 (B) 1 (C) 2 (D) 3 (E) 5
16. If it is 9am now, what time will it be in 2003 hours from now?
- (A) 11pm (B) 8pm (C) 8am (D) 11am (E) 12noon
17. At Utopia High, each of the 1516 students voted either 'YES' or 'NO' on whether to change the school uniform. There were 1162 more 'YES' votes than 'NO' votes. The number of students who voted 'NO' was
- (A) 344 (B) 254 (C) 177 (D) 172 (E) 127

J4

18. The side of each of the equilateral triangles in the figure is twice the side of the central regular hexagon. What fraction of the total area of the six triangles is the area of the hexagon?



- (A) $\frac{1}{6}$ (B) $\frac{1}{12}$ (C) $\frac{3}{4}$
(D) $\frac{1}{4}$ (E) $\frac{2}{3}$

19. When written in the *dd/mm/yyyy* format, the recent dates 10/02/2001 and 20/02/2002 are palindromic, as the digits read the same forwards and backwards. The sum of the digits in the first palindromic date nearest to and before 2000 is

- (A) 26 (B) 32 (C) 16 (D) 28 (E) 30

20. Natasha buys 4 double icecreams and 2 single icecreams and pays \$16. The next day she buys 2 double icecreams and 4 single icecreams and pays \$14. The cost of a double icecream is

- (A) \$1.50 (B) \$2.00 (C) \$2.50 (D) \$3.00 (E) \$3.50

Questions 21 - 30, 8 marks each correct response, 0 marks each incorrect response, 3 marks each no response, 30 marks minimum for this section guaranteed

21. Our water supply comes from rainwater tanks filled by the rain which lands on our roof. We find that 25 mm of rain puts 5000 litres of water in our tanks. If 80% of the water which lands on our roof reaches the tanks, what is the ground area, in square metres, covered by our roof? (1000 cm³ is 1 litre.)

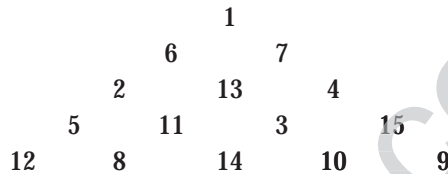
- (A) 25 (B) 2500 (C) 2000 (D) 250 (E) 200

22. Mum, Dad and their two children arrive at the river where there is a boat that will hold one adult or two children. What is the minimum number of trips across the river in either direction to get the family across?

- (A) 7 (B) 9 (C) 11 (D) 13 (E) 15

J5

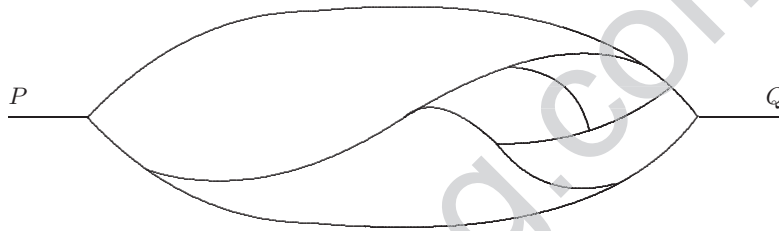
23. A triangle is called scalene if no two sides are the same length. The number of scalene triangles whose vertices are the vertices of a given cube is
- (A) 8 (B) 18 (C) 24 (D) 36 (E) 40
24. In a mathematical competition consisting of 12 problems, 8 marks are given for each correct response, 0 marks for each incorrect response and each no response is awarded 3 marks. Vicki scored 35 marks in this competition. The largest number of incorrect responses she could have had is
- (A) 1 (B) 8 (C) 11 (D) 2 (E) 7
25. The numbers from 1 to 15 are arranged in a triangular fashion, one such arrangement is shown.



- If they are arranged so that the sum of the numbers along each side of the triangle is the same and is as small as possible what is that sum?
- (A) 20 (B) 24 (C) 28 (D) 32 (E) 36
26. Steve has a broken calculator. When just turned on, it displays 0. If the + key is pressed it adds 51. If the − key is pressed it subtracts 51. If the × key is pressed it adds 85. If the ÷ key is pressed it subtracts 85. The other keys do not function. Steve turns the calculator on. The number closest to 2003 that he can get using this calculator is
- (A) 1989 (B) 2001 (C) 2002 (D) 2004 (E) 2006
27. A $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$ cube is cut into $1\text{ cm} \times 1\text{ cm} \times 1\text{ cm}$ cubes. As many of these cubes as needed are glued together to form the largest possible cube which looks solid from any point on the outside but is hollow inside. The maximum number of smaller cubes left over is
- (A) 81 (B) 32 (C) 66 (D) 125 (E) 134

J6

28. How many numbers less than 10 000 have the product of their digits equal to 84?
- (A) 24 (B) 30 (C) 42 (D) 72 (E) 84
29. A 3×3 square is divided up into nine 1×1 unit squares. Different integers from 1 to 9 are written in these 9 unit squares. For each two squares sharing a common edge, the sum of the integers in them is calculated. The minimum possible number of different sums is
- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7
30. What is the largest number of cars which can leave in some order from P and arrive in the reverse order at Q if movement is allowed only from left to right and no car can pass another as the roads are too narrow?



- (A) 6 (B) 5 (C) 8 (D) 4 (E) 7