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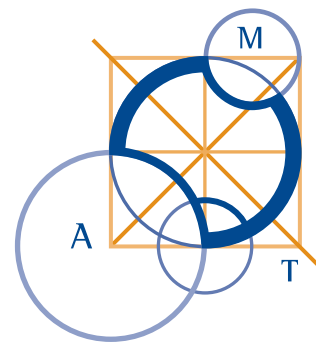
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AUSTRALIAN MATHEMATICS COMPETITION

AN ACTIVITY OF THE AUSTRALIAN MATHEMATICS TRUST

THURSDAY 2 AUGUST 2012

NAME _____



MIDDLE PRIMARY DIVISION COMPETITION PAPER

AUSTRALIAN SCHOOL YEARS 3 AND 4

TIME ALLOWED: 60 MINUTES

INSTRUCTIONS AND INFORMATION

GENERAL

1. Do not open the booklet until told to do so by your teacher.
2. You may use any teaching aids normally available in your classroom, such as MAB blocks, counters, currency, calculators, play money etc. You are allowed to work on scrap paper and teachers may explain the meaning of words in the paper.
3. Diagrams are NOT drawn to scale. They are intended only as aids.
4. There are 25 multiple-choice questions, each with 5 possible answers given and 5 questions that require a whole number answer between 0 and 999. The questions generally get harder as you work through the paper. There is no penalty for an incorrect response.
5. This is a competition not a test; do not expect to answer all questions. You are only competing against your own year in your own State or Region so different years doing the same paper are not compared.
6. Read the instructions on the answer sheet carefully. Ensure your name, school name and school year are entered. It is your responsibility to correctly code your answer sheet.
7. When your teacher gives the signal, begin working on the problems.

THE ANSWER SHEET

1. Use only lead pencil.
2. Record your answers on the reverse of the answer sheet (not on the question paper) by FULLY colouring the circle matching your answer.
3. Your answer sheet will be scanned. The optical scanner will attempt to read all markings even if they are in the wrong places, so please be careful not to doodle or write anything extra on the answer sheet. If you want to change an answer or remove any marks, use a plastic eraser and be sure to remove all marks and smudges.

INTEGRITY OF THE COMPETITION

The AMT reserves the right to re-examine students before deciding whether to grant official status to their score.



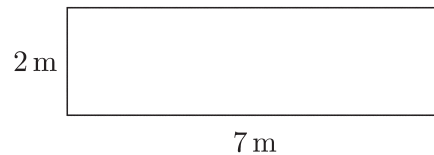
Middle Primary Division

Questions 1 to 10, 3 marks each

1. The value of $48 - 25$ is

- (A) 63 (B) 17 (C) 27 (D) 13 (E) 23
-

2. The area, in square metres, of the rectangle below is



- (A) 9 (B) 10 (C) 12 (D) 14 (E) 16
-

3. In which order would you place the following cards to make the largest 5-digit number?

11	7	10
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Card P Card Q Card R

- (A) PQR (B) QRP (C) QPR (D) PRQ (E) RQP
-

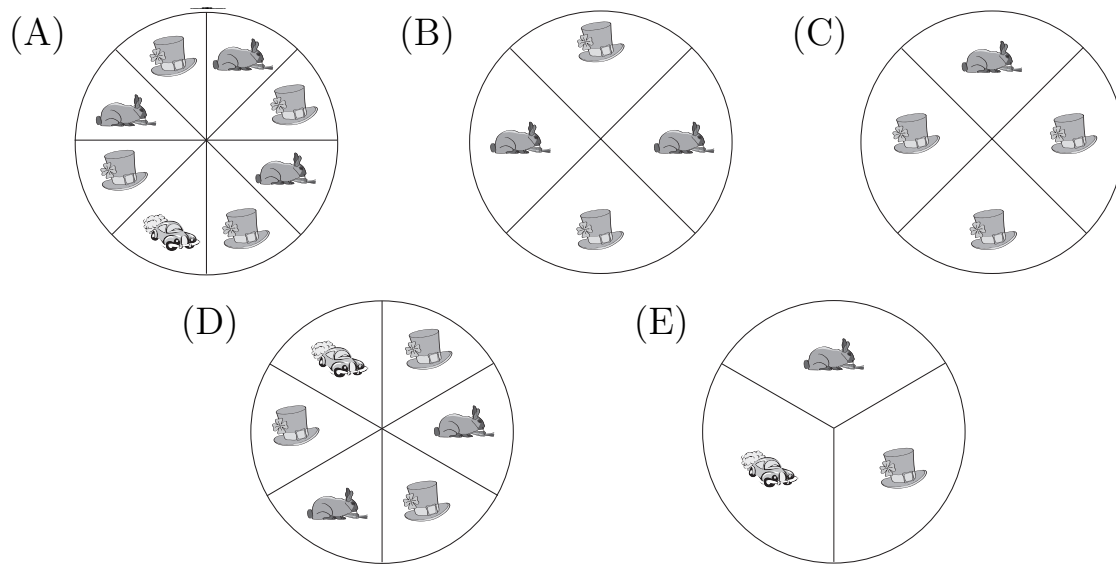
4. What should we get if we add one tenth, one hundredth and two thousandths?

- (A) 112 (B) 1.12 (C) 300 (D) 0.112 (E) 0.13
-

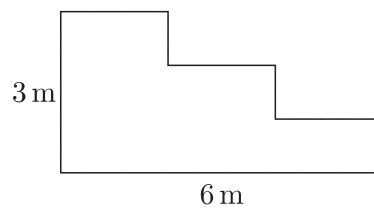
5. Mary's soccer team wins a game by two goals. Between them the two teams scored 8 goals. How many goals did Mary's team score?

- (A) 3 (B) 4 (C) 5 (D) 6 (E) 8
-

6. Which of these spinners would be more likely to spin a rabbit?



7. What is the perimeter, in metres, of the shape below?

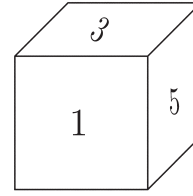
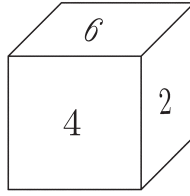
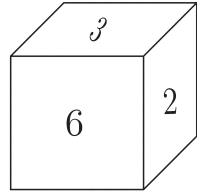


- (A) 9 (B) 12 (C) 15 (D) 18 (E) none of these

8. The digits of 2012 can be arranged to make several 4-digit numbers (the first digit of a 4-digit number cannot be zero). The difference between the largest and the smallest of these is

- (A) 2012 (B) 1202 (C) 1122 (D) 1180 (E) 1188

13. Three standard dice are rolled and the numbers on the top faces are added together.



How many different totals are possible?

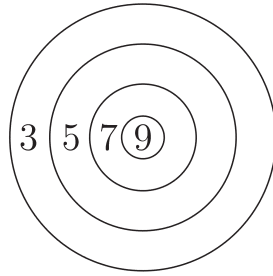
- (A) 15 (B) 16 (C) 18 (D) 24 (E) 36
-
14. A garden stake is used to support a small tree. 90 cm of the stake is above the ground and one-third of the stake is below the ground. How long is the stake?
- (A) 135 cm (B) 120 cm (C) 93 cm (D) 90 cm (E) 30 cm
-
15. The square shown is a magic square. This means that the sum of all rows, columns and diagonals are the same.

15	R	
10		14
11		

What is the value of R?

- (A) 8 (B) 9 (C) 12 (D) 13 (E) 16
-
16. Adrian is watching a 90-minute movie. His computer indicates that the movie is seven-tenths of the way through. How long is there still to play?
- (A) 25 minutes (B) 27 minutes (C) 37 minutes
(D) 63 minutes (E) 90 minutes
-

17. Michael threw 8 darts at the dartboard shown.



All eight darts hit the dartboard. Which of the following could have been his total score?

- (A) 22 (B) 37 (C) 42 (D) 69 (E) 76

18. Five students, Cam, Franco, Adrian, Trent and Xavier line up in order of age from youngest to oldest. Cam is next to Adrian in the line while Franco and Trent are not next to each other. Who cannot be in the middle of the line?

- (A) Cam (B) Franco (C) Adrian (D) Trent (E) Xavier

19. Alex placed 9 number cards and 8 addition symbol cards on the table as shown.

$$\boxed{9} + \boxed{8} + \boxed{7} + \boxed{6} + \boxed{5} + \boxed{4} + \boxed{3} + \boxed{2} + \boxed{1}$$

Keeping the cards in the same order he decided to remove one of the addition cards to form a 2-digit number. If his new total was 99, which 2-digit number did he form?

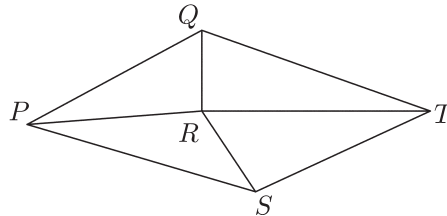
- (A) 32 (B) 43 (C) 54 (D) 65 (E) 76

20. Ann thinks of a two-digit number and notices that the first digit is one more than twice the second digit. How many different numbers could she have thought of?

- (A) 1 (B) 2 (C) 3 (D) 5 (E) 6

Questions 21 to 25, 5 marks each

21. Five towns are joined by roads, as shown in the diagram.



How many ways are there of travelling from town P to town T if no town can be visited more than once?

- (A) 3 (B) 5 (C) 6 (D) 7 (E) 9

22. Mike is one year older than his brother and one year younger than his sister. When all three ages are multiplied together the result is 504. What is the sum of their ages?

- (A) 17 (B) 16 (C) 21 (D) 24 (E) 36

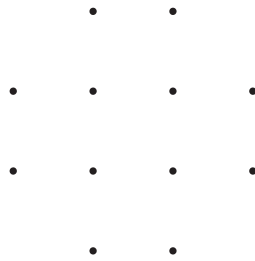
23. One of the mischief makers in a class decided to play a prank by glueing together some $1 \times 1 \times 1$ blocks to form a solid cube. If he used 64 blocks to make the cube and needed to put glue on every face that was to be touching another face, how many faces were glued?

- (A) 176 (B) 216 (C) 240 (D) 264 (E) 288

24. Jasdeep plays a game in which he has to write the numbers 1 to 6 on the faces of a cube. However, he loses a point if he puts two numbers which differ by 1 on faces which share a common edge. What is the least number of points he can lose?

- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

25. Twelve points are marked on a square grid as shown.



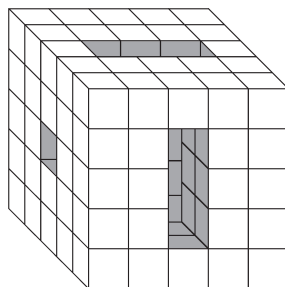
How many squares can be formed by joining 4 of these points?

- (A) 5 (B) 6 (C) 9 (D) 11 (E) 13
-

For questions 26 to 30, shade the answer as a whole number from 0 to 999 in the space provided on the answer sheet.

Question 26 is 6 marks, question 27 is 7 marks, question 28 is 8 marks, question 29 is 9 marks and question 30 is 10 marks.

26. A $5 \times 5 \times 5$ cube has a $1 \times 1 \times 5$ hole cut through from one side to the opposite side, a $3 \times 1 \times 5$ hole through another and a $3 \times 1 \times 5$ hole through the third as shown in the diagram.



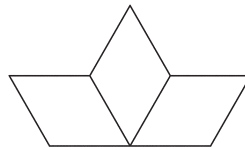
How many $1 \times 1 \times 1$ cubes are removed in this process?

27. The difference between two numbers is 42. If five is added to each of them, the larger number becomes three times the smaller number. What is the larger number at the start?

28. A rectangular tile has a perimeter of 24 cm. When Sally places four of these tiles in a row to create a larger rectangle, she finds the perimeter is double the perimeter of a single tile. What would be the perimeter of the rectangle formed by adding another 46 tiles to make a row of 50 tiles?

29. How many ways are there of walking up a set of 7 stairs if you can take one or two steps at a time?

30. A rhombus-shaped tile is formed by joining two equilateral triangles together. Three of these tiles are combined edge to edge to form a variety of shapes as in the example given.



How many different shapes can be formed? (Shapes which are reflections or rotations of other shapes are not considered different.)
