Westpac

AUSTRALIAN MATHEMATICS COMPETITION FOR THE WESTPAC AWARDS

AN ACTIVITY OF THE AUSTRALIAN MATHEMATICS TRUST

WEDNESDAY 25 JULY 2007

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 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 filled in. It is your responsibility that the Answer Sheet is correctly coded.
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 read by a machine. The machine will see 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 AMC 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. Which of the following numbers is the largest?

(A) 231 (B) 201 (C) 321 (D) 123 (E) 302

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2. Which number is made up with 1 hundred, 4 tens and 3 ones?

(A) 413 (B) 143 (C) 341 (D) 1043 (E) 134

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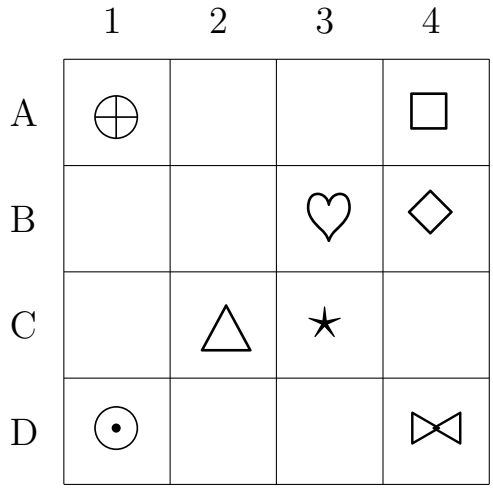
3. The grid below gives the position of different shapes. For example, the $\diamond$ is at B4.



On which square is the $\bigstar$?

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

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4. Olivia is 2 years old. Her brother, Matthew, is 5 years older than her. How old is Matthew?

(A) 2 (B) 3 (C) 5 (D) 7 (E) 10

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5. If I buy a shirt for \$25 and a T-shirt for \$12, how much change do I get from \$50?

(A) \$13 (B) \$23 (C) \$25 (D) \$33 (E) \$37

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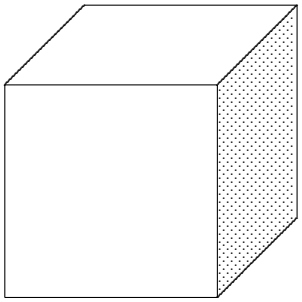
6. How many edges does a cube have?



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

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7. If Andrew is in the middle of the tuckshop queue, which number could be the total number of students in the queue?

(A) 4 (B) 6 (C) 8 (D) 9 (E) 12

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8. When a room was being painted, five curious cats walked in. Four cats got paint on their front paws and one cat got paint on its back paws. How many paws did NOT have paint on them?

(A) 5 (B) 6 (C) 8 (D) 10 (E) 12

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9. Jason has to finish his homework before he can watch '*Blastoids*' on TV at 4:35 pm. It takes him 17 minutes to do his homework. What is the latest time he can start his homework and still finish in time to watch '*Blastoids*'?

(A) 4:52 pm (B) 4:20 pm (C) 4:18 pm (D) 4:28 pm (E) 4:08 pm

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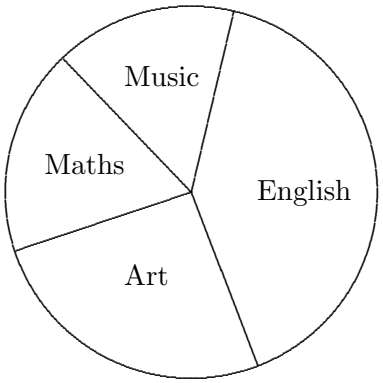
10. Last Tuesday, a class studied Maths, Music, English and Art in the proportions indicated in the pie chart.



Which of the following statements is true?

(A) They spent more time on Music than they did on Art.

(B) They spent more time on Music than they did on English.

(C) They spent more than half the time on Music and English.

(D) They spent more than half the time on Maths and Art.

(E) They spent the same amount of time on Maths as they did at Art.

Questions 11 to 20, 4 marks each

11. 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

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12. In squiddish, a squirt is worth 5 points, a grapple is worth 3 points and a wrap is worth 2 points. If the Sawtell Squids scored 4 squirts, 3 grapples and 3 wraps, how many points did they score?

(A) 35 (B) 41 (C) 33 (D) 39 (E) 32

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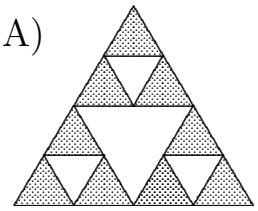
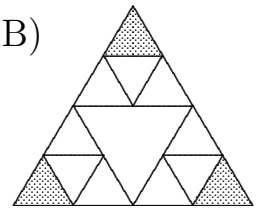
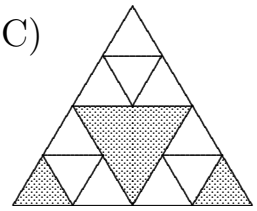
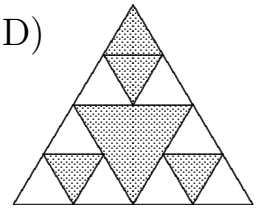
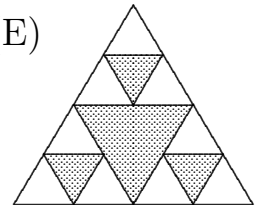
13. Which of the following shows one half of the figure shaded?

(A) 

(B) 

(C) 

(D) 

(E) 

14. Abdul's class has a set of 30 lockers arranged in 3 rows of 10 and numbered from 1 to 30 starting from the top left hand corner and counting across each row from left to right until reaching the bottom right hand corner.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

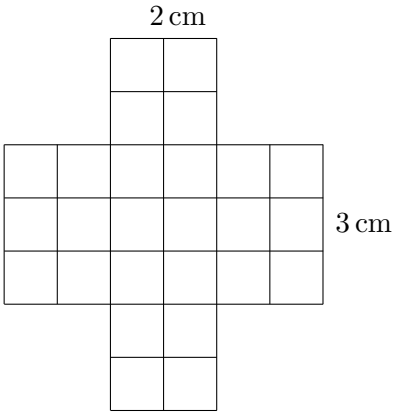
- Abdul has locker No 7.
- Betty's locker is below Abdul's and two to the left.
- Cheung has a locker with a number 6 more than Betty's locker.
- Dilip has a locker two rows above Cheung's.
- Evita's locker is five to the right and one below Dilip's.

Which two students have lockers next to each other?

(A) Abdul and Betty (B) Cheung and Evita (C) Evita and Betty

(D) Dilip and Abdul (E) Abdul and Cheung

15. 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 hold?



(A) 6 (B) 13 (C) 9 (D) 7 (E) 12

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16. The game of *Four Tofu* 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

	2		
			1
	1	3	
4			

(A) 13 (B) 11 (C) 15 (D) 12 (E) 10

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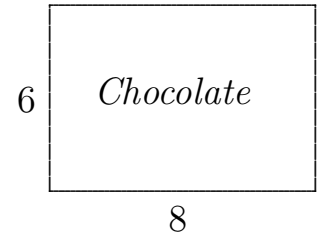
17. Jane is given a large block of chocolate which is made up of square pieces and is 6 pieces wide and 8 pieces long.



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

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

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18. Bruce gives a number problem to Helen. He told her to choose a number, add 5 to it, double that sum and then subtract 10. Helen's answer was 30. Which number did she choose?

(A) 15 (B) 25 (C) 45 (D) 40 (E) 30

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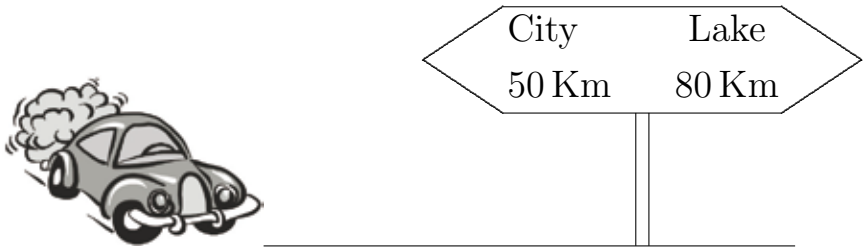
19. While driving from the city to the lake, Karen passes the road sign shown in the diagram.



About an hour later she notices a sign indicating she has just 5 km to go to the lake. How far has she travelled from the city?

(A) 50 km (B) 80 km (C) 125 km (D) 30 km (E) 65 km

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20. Jacqui had \$5.10 in 5, 10, 20 and 50 cent coins. She had an equal number of each type of coin. How many coins did she have?

(A) 24 (B) 20 (C) 16 (D) 22 (E) 18

Questions 21 to 25, 5 marks each

21. Alice and Kate collect some seashells. Together they have 30 seashells. Which could **NOT** be true?

(A) Alice has 12 seashells.
(B) Kate has twice as many seashells as Alice.
(C) Kate has one more seashell than Alice.
(D) Alice has two more seashells than Kate.
(E) Alice and Kate have the same number of seashells.

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22. How many three-digit numbers greater than 900 are there that satisfy the following conditions?

- The sum of the digits is 14.
- The digits are all different.
- The tens digit is an odd number.

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

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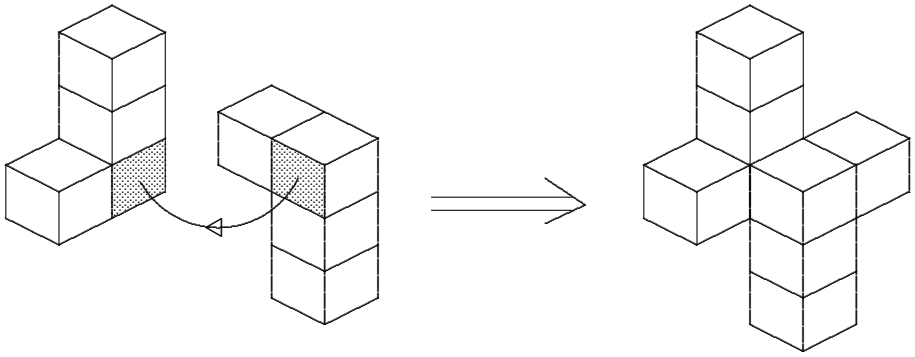
23. Two L shaped solids are each made up from 4 cubes as shown in the left of the diagram. The two shaded faces are glued together to form the solid shown on the right in the diagram.



How many faces of the original 8 cubes are visible if we can look at the solid from any angle?

(A) 28 (B) 30 (C) 32 (D) 34 (E) 36

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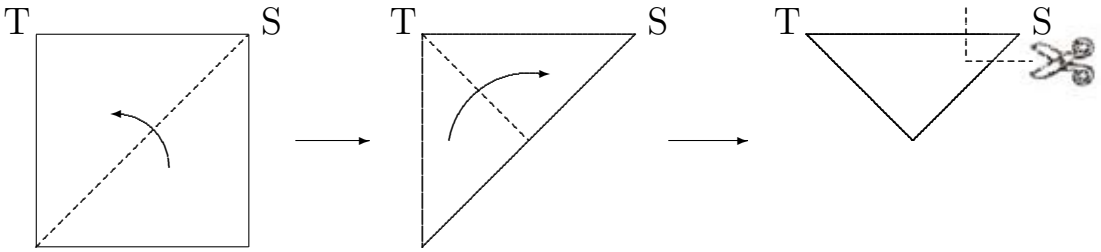
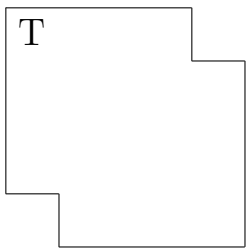
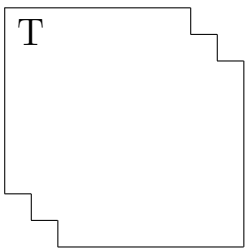
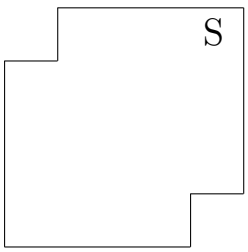
24. A square piece of paper is folded along its centre line and then folded again as shown.

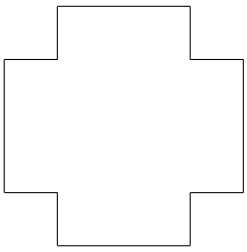


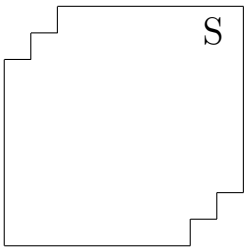
A cut is made along the dotted line in the third diagram. Which of the following could be the shape of the paper when it is unfolded?

(A)


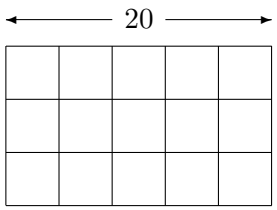
(B)


(C)


(D)


(E)


25. 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

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.

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26. When I opened my new maths book the sum of the two page numbers facing me was 317. What was the number of the next page?

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27. 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 goup?

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28. I am thinking of a number. It has three digits and is between 110 and 130. The sum of the digits is 9 and the number is even. What is this number?

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29. 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?

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30. Ace, Bea, Cec, Dee, Eve, Fie and Geo are 1, 2, 3, 4, 5, 6 and 7 years old, in some order. Dee is three times as old as Bea. Cec is four years older than Eve. Fie is older than Ace and Ace is older than Geo, but the combined ages of Ace and Geo is greater than the age of Fie. What is Ace's age?

What is the AMC?

The AMC is a mathematics competition containing thirty problems that students can attempt to answer in the time allowed. The students use a special answer sheet that is processed and marked by computer.

There are five papers. While each paper is attempted by students from different year levels, each student is assessed only against other students in the same school year and region.

The earliest problems are very easy, then the problems get progressively more difficult until the end when they are challenging to the most gifted student. Students of all standards will progress and find their point of challenge.

We believe this to be the largest event in Australia for which participants pay an entry fee.
The AMC has run every year since 1978 and is now a significant international event.

Benefits to Students

The AMC gives students external recognition of their achievements. All students receive a certificate and a detailed report showing how they went on each problem with comparative statistics.

Prizes will be awarded to the top students.

Unlike formal mathematics testing, many of the problems are set in situations to which students can relate, showing the relevance of mathematics to everyday life. Above all, the AMC is designed to be a fun event removed from the pressures of formal assessment with problems designed to be of sufficient interest to stimulate discussion with friends, parents or in the classroom.

Australian Mathematics Trust

The AMT is a national non-profit organisation and its Board includes representatives from the Australian Association of Mathematics Teachers, Australian Academy of Science and Australian Mathematical Society. The AMT administers a number of further mathematical activities such as the Mathematics Challenge for Young Australians and the Australian Mathematical Olympiad.

AMT Publishing

The AMT publishes its own material of national and international significance for those students who seek extra mathematical challenge.

Problems to Solve in Middle School Mathematics, is a collection of problems presented in ready to be photocopied format for classroom use with students in Years 5 to 8.

A Primary version of AMC (Australian Mathematics Competition for the Westpac Awards) *Solutions and Statistics* is available for 2004, 2005 and 2006. The 2007 version will be available in early 2008. Each year these books include the questions, full solutions, statistics, information on Australian achievement rates, analyses of the statistics as well as discrimination and difficulty factors for each question. Prize winners are also listed.

These and other titles can be ordered via the internet or by mail.

Contact

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