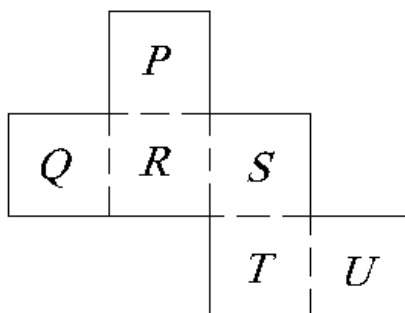# 2002 QAMT Competition
Year 8 Paper

Attempt as many problems as you can in the time allowed. Working and explanations (even for the multiple choice problems) should be set out fully in clear English. The judges will take into consideration the quality of expression and ingenuity of your attempts at solutions.

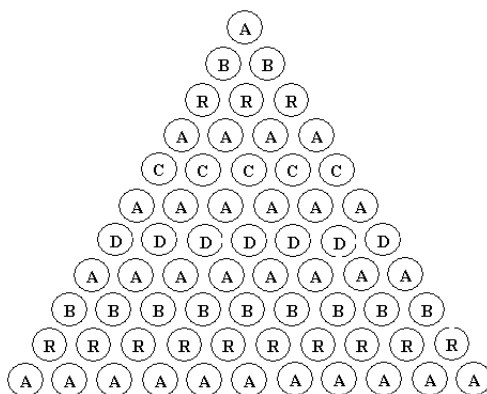**You must put your full name and school on all working handed in.**

Q1. (1 point) When the diagram shown is folded to make a cube, then the face marked U is opposite to the face marked

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

Q2. (1 point) In how many ways can the word ABRACADABRA be spelt out, using adjacent letters in the arrangement below?

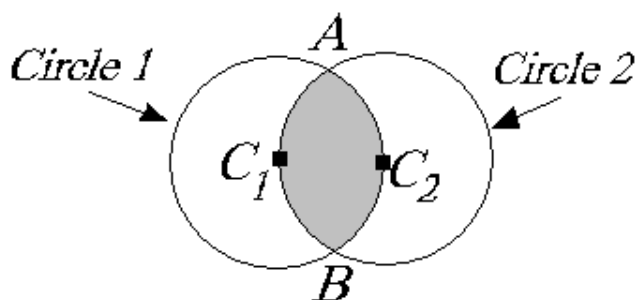(A) 100   (B) 144   (C) 512   (D) 1024   (E) More than 1024

Q3. (1 point) My Mum drives me from home to school each morning and then she returns home. She takes the same route in both directions and does not stop. On the way to school her average speed is 60 km/h and on the way home her average speed is 40 km/h. Which of the following is her average speed for the entire trip?

(A) 45 km/h   (B) 48 km/h   (C) 50 km/h   (D) 52 km/h   (E) 48.99 km/h

TURN OVER

Q4. (2 points) A group of year 8 students in Longreach organised a car wash. Some cars had a basic wash for $5 each while the rest had a deluxe wash for $7. A total of $176 was raised. What was the minimum number of cars washed?

   (A) 23   (B) 24   (C) 26   (D) 28   (E) 30

Q5. (2 points) The diagram below shows two circles, Circle 1 and Circle 2. The centre *C1* of circle 1 lies on the circumference of Circle 2, and the centre *C2* of Circle 2 lies on the circumference of Circle 1. The two circles intersect at points *A* and *B*. The length of the line joining *C1* and *C2* is 2 cm, and the length of the line joining *A* and *B* is $2\sqrt{3}$ cm. Find the area common to both circles (shaded).

Q6. (3 points) A tennis tournament had five teams of two people:

- Fred & Alice
- Jayne & David
- Shen & Felicity
- Lynne & Brian
- Gina & Richardo

However, not all of the games were friendly and not all the players shook hands. In fact, no player shook his or her own hand, no player shook the hand of their partner, only some players shook their opponents' hands and no two players shook hands more than once. At the end of the tournament, Richardo asked each player how many hands he or she had shaken. Every player gave a different answer, except Gina had the same answer as Richardo. How many hands did Gina shake?

TURN OVER