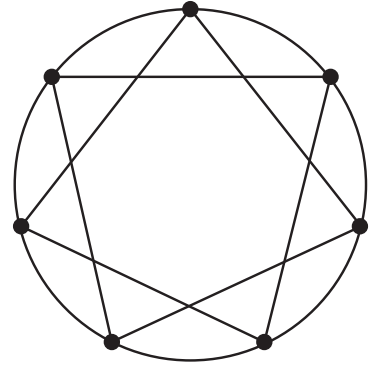


## 2013 UQ/QAMT Problem Solving Competition - Year 8 Paper

*All questions have equal value. Non-CAS calculators may be used.*

### Question 1

Consider the star made by connecting 7 points equally spaced around the circumference of a circle, as shown in the diagram. What is the interior angle of the heptagon?



### Question 2

At some point in 2011 or 2012 Michael suddenly observed “at the next exact hour we’ll have three times as many minutes remaining this month as there will have been hours in the past part of the month.” What was the exact date (to the nearest hour)?

### Question 3

My internet connection is slow. The more files I download at once the slower it gets. At 1:00 pm I started downloading the three files simultaneously. At that point the time remaining to complete the downloads were given as 10, 8 and 4 minutes. At what time will the downloads all be finished?

### Question 4

A chessboard has squares of side length 1 unit. A circle is drawn through the four corners of each black square and its interior coloured black (so each black square is covered up). What is the area of the remaining white space?

### Question 5

An eggsellent merchant sells eggs. One day a customer walked up and said, “I’ll buy half of all your eggs, plus half an egg.” The merchant sold the appropriate number of eggs. Soon after that another customer came along and said exactly the same thing, and again bought the appropriate number of eggs. A third customer and fourth customer in turn did the same. At this point the eggsellent merchant had sold all his eggs. How many did he start with?