SEVENOAKS SCHOOL

SIXTH FORM ENTRANCE TEST
for entry into Lower Sixth (Year 12) in September 2021

MATHEMATICS
Higher Level

NAME (IN CAPITALS): ……...……

School: ……

Curriculum: ……..……..
(eg (I)GCSE, MYP, your national curriculum or Not Studied)

Time allowed: 30 minutes

Equipment needed: Pen, pencil, eraser

Information for candidates:
Calculators are NOT allowed.
Write your name, school and the curriculum you follow on this page.
There are FIVE questions. Each question is worth 5 marks. You are advised to concentrate on **two/three** questions giving FULL written solutions to each problem but you can attempt more if you have time.

The following formula may be useful:

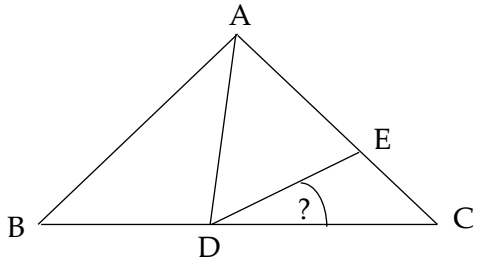
nth term of an arithmetic progression

$$u_n = u_1 + (n-1)d$$

where u_1 is the first term and d is the common difference

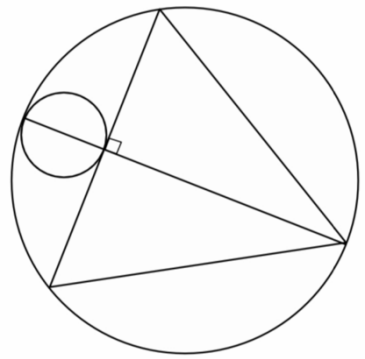
1. How many positive integers less than or equal to 1000 are not divisible by any of 2, 3 or 5?

2. In triangle ABC, AB = AC, AE = AD and angle BAD = 30°.
What is the size of angle CDE?



3. If $x^2 - 3x + 1 = 0$, what is the value of $x^2 + \frac{1}{x^2}$ in simplest form?

4. In the diagram, the triangle is equilateral. What is the area of the large circle divided by the area of the small circle?



5. Prove algebraically that the sum of the squares of any three consecutive odd numbers always leaves a remainder of 11 when divided by 12.