SHREWSBURY SCHOOL

MATHEMATICS PRIZE, 1959

1. Find four consecutive numbers divisible by 5, 7, 9, 11 respectively.

2. Add together all the integers between 1000 and 10,000 that can be formed with the digits 0, 1, 2, 3, 4, 5.

3. A point P is taken inside triangle ABC, in which $a=3$, $b=4$, $c=5$ such that $\mathrm{AP}+a=\mathrm{BP}+b=\mathrm{CP}+c=k$. Find k.

4. Prove that, if $\dfrac{ab}{b+x} - \dfrac{cd}{d+y} = \dfrac{bc}{x} - \dfrac{ad}{y} = z$, then either $\dfrac{x}{b} + \dfrac{y}{d} + 1 = 0$ or $z = a - c$.

5. APQRB is a circle on AB as diameter ; C is the foot of the perpendicular from Q to AB. If $\mathrm{P\hat{C}Q} = \mathrm{Q\hat{C}R}$, prove $\mathrm{C\hat{P}Q} = \mathrm{C\hat{Q}R}$.

6. In triangle ABC, D, E, F are the mid-points of BC, CA, AB respectively, and Y, Z the feet of the altitudes from B and C. YZ meets FD, DE in M, N respectively. Prove that EF is the common tangent of circles EYN, FZM, and that the tangents from D to these two circles are equal.