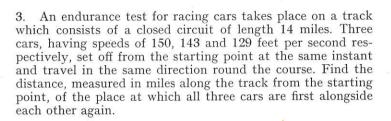
## 150A 8 MAX.

## SHREWSBURY SCHOOL

## MATHEMATICS PRIZE, 1957

- 1. (i) Evaluate  $\sqrt[3]{[\log(0.7)]}$  correct to three significant figures.
  - (ii) The number N is equal to  $2^{100}$ . How many digits does N contain and what are the first two digits?
- 2. The difference between the simple and the compound interest on a certain sum for 3 years at 5% is £6. 3s. Find the sum.



4. Factorize the following:

(i) 
$$x^3 - 729x$$
 (ii)  $x^2 - y^2 + 3z^2 + 2yz + 4zx$  (iii)  $p^4 - 12p^2 + 4zx$ 

5. Solve the equations: (i)  $9^{x}-2(3^{x})=3(3^{x+1}-8)$  /4 Equations: (ii)  $\frac{2}{x+8}+\frac{5}{x+9}=\frac{3}{x+15}+\frac{4}{x+6}$  // Surflip on 5

25

13

12

6. ABC is a triangle in which AB=AC. The line bisecting the angle B meets AC at D. K is the point which is equidistant from B and D and such that KA is parallel to BC.

Prove that a circle can be drawn through the points B, D, A, K.

7. ABC is any triangle. K is the mid-point of BC and L is the point on AC which is between A and C and such that AL: LC=2: 1. AK and BL intersect at X.

Prove (i) AX: XK=4:1, (ii) BX: XL=3:2.

Further, if CX produced meets AB at M, find the ratio in which M divides AB.

8. Prove that the sum of the diagonals of a quadrilateral is greater than the semiperimeter and less than the perimeter of the quadrilateral.