**First project for numerical method group B**

where *p* denotes the probability A will win any specific rally (independent of the server). (See [Keller, J], p. 267.) Determine, to within 10-3, the minimal value of *p* that will ensure that A will shut out B in at least half the matches they play.

30. In the design of all-terrain vehicles, it is necessary to consider the failure of the vehicle when attempting to negotiate two types of obstacles. One type of failure is called *lumg-up failure* and occurs when the vehicle attempts to cross an obstacle that causes the bottom of the vehicle to touch the ground. The other type of failure is called *noJe-in failure* and occurs when the vehicle descends into a ditch and its nose touches the ground. The accompanying figure, adapted from [BekJ, shows the components associated with the nose-in failure <?f a vehicle. In that reference it is shown that the maximum angle *a* can be negotiated by a vehicle when *f3* is the maximum angle at which hang-up failure does *not* occur satisfies the equation

$$A\sin\alpha\cos\alpha + B\sin 2\alpha - C\cos\alpha - E\sin\alpha = 0,$$

Where

$$A = l\sin\beta_1,\ B = l\cos\beta_1,\ C = (h + 0.5D)\sin\beta_1 - 0.5D\tan\beta_1'$$

$$\text{and } E = (h + 0.5D)\cos\beta_1 - 0.5D.$$

find a , b and c by Newton's Methexl using computer programming (fortran - paskal or C) until two week later

**a**--. when $l$ = 89 in., $h$ = 49 in., $D$ = 55 in., and $\beta_1$ = 11.5 degree .so, angle α is

Verify

**b**-- Find α for the situation when $l$, $h$, and $\beta_1$ are the same as in part (a) but $D$ = 30 in.

**c**- plot variation of α against $\beta_1$ and D by changing :

$\beta_1$: 10 – 15 – 20 – 25 degree

D: 25 – 30- 35 – 40 – 45 -50 – 55 - 60 in .

When $l$ = 89 in., $h$ = 49 in