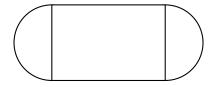(1) (a) Complete the square for: $3 - 2x - 4x^2$.

(b) What is the maximum value of $\sin\theta - \sin^2\theta$?

(c) What value of t minimizes $1 + 4t - 2t^2$?

(2) I wish to build a running track in the shape of a rectangle with two semi-circles added to each end:

(a) If the total perimeter should be 800m, what dimensions give the maximum area?

(b) If the total area should be 500m^2, what is the shortest possible length of the track?