NCEA Level 3 Calculus (Integration)
24. Kinematics

Reading

Go and watch...

https://www.youtube.com/watch?v=fIaupXkpB00

Questions

All distances are given in m, and all times in s, unless otherwise stated.

1. A distress flare is fired vertically into the air from a boat at sea. The height in metres of the flare t seconds after firing is given by
$$h = 122.5t - 4.9t^2.$$
   (a) What is the initial velocity of the flare?
   (b) At the peak of its flight, what is the vertical velocity of the flare?
   (c) What is the maximum height reached by the flare?

2. Part of the course for an ocean swim runs from bouy A to bouy B. Swimmers must come ashore on the at some point P along a long straight beach on the way. Bouy A is 800 m away from the beach, and bouy B is 600 m away from the beach. What is the least distance that a swimmer must swim? (Hint: minimise $PA + PB$.)