Question 11 **(8 marks)**

A Formula One (F1) racing car has an initial displacement of 192 metres with an initial velocity of 24 metres per second. It accelerates for a period of 11 seconds in a straight line so that its velocity v metres per second and displacement x metres are related by the equation:

$$v(x) = \frac{x}{8}$$

(a) Determine the acceleration a as a function of displacement x i.e. determine $a(x)$.
(2 marks)

(b) Determine the displacement x as a function of time t. (2 marks)

(c) Calculate the top speed reached and the distance travelled during the 11 second period of acceleration. (4 marks)