Worksheet #4

(1) A tank contains 100 gal of water and 50 oz of salt. Water containing a salt concentration of $\frac{1}{2}\left(1 + \frac{1}{2}\sin t\right)$ oz/gal flows into the tank at a rate of 2 gal/min and the mixture in the tank flows out at the same rate. Find the amount of salt in the tank at any time.

(2) A 50 kg mass is shot from a cannon straight up with an initial velocity of 10 m/s off a bridge that is 100 meters above the ground. Let the air resistance is given by $5v$ where v is the velocity. Find the velocity at any time (before it hits the ground). Find a function that describes the position.