Instructions: solve the following differential equations (by using the method of integrating factor)

1.
$$\frac{dy}{dx} - 5y = 10x$$

2.
$$xy' + 3y = \frac{\sin x}{x^2} \qquad x > 0$$

3.
$$(1+x)\frac{dy}{dx} + y = \sqrt{x} \qquad x > 0$$

4.

$$t\frac{dy}{dt} + 2y = t^3, \qquad t > 0 \qquad y(2) = 1$$

5.

$$\theta y' - 2y = \theta^3 \sec\theta \tan\theta, \qquad \theta > 0 \qquad y(\pi/3) = 2$$