

**Quiz 4**—————**Math 1272**

**1** The region bounded above by the parabola  $y = 4x - x^2$  and below by the line  $y = 2x$  is covered by a thin metal sheet of density  $\rho$ . Set up but DO NOT SOLVE the integrals that will give  $M_y$  and  $M_x$ .

**2** Solve the following differential equation:

$$\frac{dx}{dt} = \frac{2x + 5}{t} \quad x(1) = 8.$$

**3** Set up but DO NOT SOLVE the integral that represents the force exerted on the dam with dimensions as displayed on the board. Let  $\rho$  be the weight density of water and  $g$  be the force of gravity (the two constants).

**4** Solve the following differential equation:

$$\frac{dy}{dx} = \sqrt{x}e^y \quad y(1) = 0.$$