

**PEP 2017**  
**Assignment 2**

**1) Evaluate the following integrals:**

(a)  $I = \int \sqrt{x} dx$

(b)  $I = \int 3 \sin^2 \cos x dx$

(c)  $I = \int (\frac{1}{2} - 2x^2) dx$

(d)  $I = \int_0^1 x\sqrt{1-x} dx$  (Hint: You can evaluate it using the integration by parts)

(e)  $I = \int_0^\pi x^2 \sin x dx$

**(2)** Calculate the area bounded by the positive branch of the parabola  $y^2 = 25x$ , the x-axis and the ordinates where  $x = 0$  and  $x = 36$ .

**(3)** Calculate the arc length of the positive branch of the curve  $y^2 = (7-x)(5+x)$  between  $x = -5$  and  $x = 1$ .

**(4)** Calculate the volume generated by revolving the ellipse  $x^2/9 + y^2/25 = 1$  about the x-axis.

**(5)** A hemisphere has a radius of 125mm. Calculate the position of its center of mass.