M1B/Schoenbrun Section 6.6 Physics Applications

1) When a particle is located a distance x meters from the origin, a force of $\cos(\pi x/3)$ newtons acting on it. How much work is done in moving the particle from x=1 to x=2?

2) A spring has a natural length of 20 cm. If a 25 N force is required to keep it stretched to a length of 30cm, how much work is required to stretch it from 20cm to 25cm?

3) Sketch the region bounded by the curves and visually estimate the location of the centroid. Then find the exact coordinates of the centroid.

$3x + 2y = 6,\ y = 0,\ x = 0$

4) Consider the area enclosed by the right limb of the hyperbola $x^2 - y^2 = 1$ and y=2. Where are the coordinates of the centroid of this area?