Polar co-ordinates and Double Integrals

1. Evaluate
$$\int_D y \, dA$$
for the region D indicated below.

2. Evaluate
$$\int_D \frac{1}{\sqrt{x^2 + y^2}}$$
where D is region in the first quadrant which is bounded by the curves $r = 1 + \sin\theta$ and $r = 1$.

3. Setup (but do not evaluate) an expression for the volume of the solid bounded by $z = 18 - 2x^2 - 2y^2$ and the xy plane.