Hints: $\cos^2 x = \dfrac{1+\cos 2x}{2}$,
$\sin^2 x = \dfrac{1-\cos 2x}{2}$,
$1+\tan^2 x = \sec^2 x$,
$\sin 2x = 2\sin x \cos x$

1. Consider the parametric curve

$$x = a\cos t, \quad y = a\sin t. \ , \quad t = 0...\ 2\pi$$

   (a) Sketch this curve.

   (b) Compute the length (set up the correct integral and evaluate) of this curve from $t = 0...\ 2 * \pi$.

2. Consider the parametric curve

$$x = \sin^2 t \ , \ y = 2\cos^2 t \ , \ t = 0...\ 2\pi$$

   (a) Sketch this curve.

   (b) Set up an integral to compute the length of this curve from $t = 0...\ 2\pi$..

For each of the following:

(a) Shade the area in question;
(b) find the points of intersection (if needed);
(c) set up the integral for the area;
(d) evaluate the area¿

3. The region bounded by $r = 2 + 2\sin(\theta)$

4. The region bounded $INSIDE$ $r = 2\sin(\theta)$ and $OUTSIDE$ $r = 1$.

5. The region bounded by $BOTH$ $r = \sin(\theta)$ and $r = \cos(\theta)$

6. The region bounded by $r = \cos(2\theta)$.