

136.170 problems worksheet - n. 6

1. Find the area of the region bounded by the curves:

(a) $x = \frac{t^2 + 1}{2}$, $y = e^{t^2}$, $t = 1$, $t = 3$ ($1 \leq t \leq 3$) and the x-axis 

(b) $x = a \cos \theta$, $y = b \sin \theta$, $0 \leq \theta \leq \pi$

2. Find the area of the region enclosed by one loop of the curve $r = 4 \sin 3\theta$.

3. Find the area of the region that lies inside the first curve and outside the second curve:

(a) $r = 1 - \sin \theta$, $r = 1$

(b) $r = 1 + \cos \theta$, $r = 3 \cos \theta$

4. Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line:

(a) $y = x^3$, $x = 2$, $y = 0$; about the x -axis

(b) $y = e^x$, $y = 0$, $x = 0$, $x = 1$;
about the x -axis

(c) $y = \sec x$, $y = 1$, $x = -1$, $x = 1$;
about the x -axis