

Calculus II
Exam 4, Fall 2002

1. Find the foci of the ellipse given by the equation $x^2 + 4y^2 + 2x = 8$.
2. The point $P(1,5)$ lies on the parabola given by the equation $y^2 - 8x - 2y = 7$. Let F be the focus of this parabola.
 - a) What are the coordinates of the focus F ?
 - b) What is the angle between the line PF and the tangent to the parabola at P ?
3. Find the equation of the ellipse with vertices at $(0, \pm 2)$ and foci at $(0, \pm 1)$.
4. Find the integral (do not try to evaluate it) giving the length of the spiral $r = 2\theta$ from $\theta = 0$ to $\theta = 2\pi$.
5. Find the area enclosed by the cardioid $r = 2 + 2\sin\theta$.