(1) Section 6.2: 17
(2) Section 6.5: 22
(3) Section 6.5: 24
(4) Section 6.5: 36
(5) Each of the following is difficult or impossible to evaluate directly but can be computed by other methods. Compute each one and justify your method.
   (a) $\int_C e^{x+y}\,dx + e^{x+y}\,dy$ where C is part of the curve $x^4 + y^4 = 2$ traced from $(-1, 1)$ to $(1, 1)$.
   (b) $\int_C sin(x^4)\,dx + y^3\,dy$ where C is the path $\mathbf{x}(t) = (sin(t), t)$, $0 \leq t \leq \pi$
(6) Suppose $\mathbf{F}(x, y) = (M(x, y), N(x, y))$ is a continuously differentiable vector field defined everywhere on $\mathbf{R}^2$ except at three points indicated by asterisks in the drawing below. Assume that $\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y} = 0$ at all points in the domain of $\mathbf{F}$. Several curves are drawn in the picture below. Assume that

$$\int_{C_1} M\,dx + N\,dy = 1$$

$$\int_{C_2} M\,dx + N\,dy = 2$$

and

$$\int_{C_3} M\,dx + N\,dy = 3.$$

Find the line integrals

$$\int_{C_i} M\,dx + N\,dy$$

for the remaining curves C_i $(i = 4, 5, 6)$.