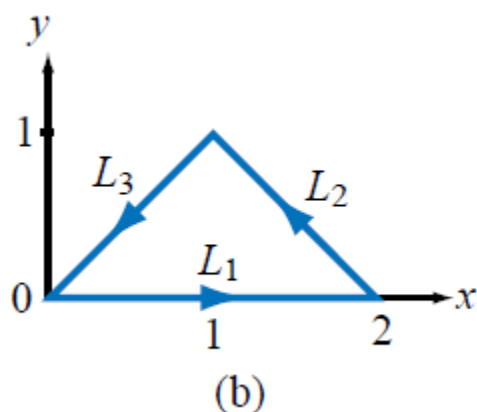
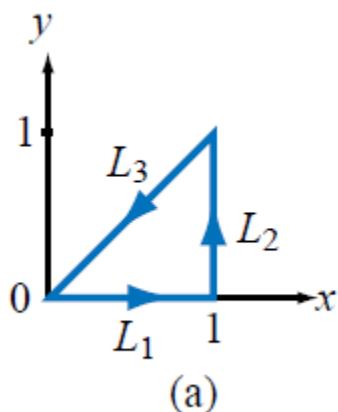


Problem 3.43 For the vector field $\mathbf{E} = \hat{x}xy - \hat{y}(x^2 + 2y^2)$, calculate

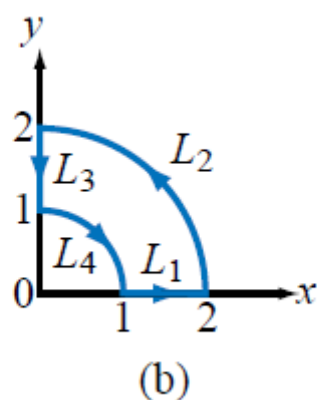
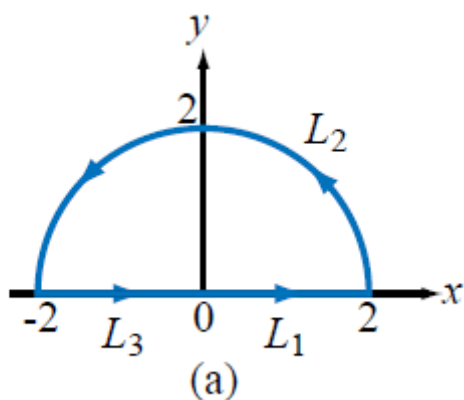
- (a) $\oint_C \mathbf{E} \cdot d\mathbf{l}$ around the triangular contour shown in Fig. P3.50(a), and
 (b) $\int_S (\nabla \times \mathbf{E}) \cdot d\mathbf{s}$ over the area of the triangle.



Problem 3.44 Repeat Problem 3.43 for the contour shown in Fig. P3.43(b).

Problem 3.45 Verify Stokes's theorem for the vector field $\mathbf{B} = (\hat{r}r \cos \phi + \hat{\phi} \sin \phi)$ by evaluating:

- (a) $\oint_C \mathbf{B} \cdot d\mathbf{l}$ over the semicircular contour shown in Fig. P3.45(a), and
 (b) $\int_S (\nabla \times \mathbf{B}) \cdot d\mathbf{s}$ over the surface of the semicircle.



Problem 3.46 Repeat Problem 3.45 for the contour shown in Fig. P3.45(b).

