p. 1120 (14.2)

Evaluate the line integral.

5. $\int_C (2x)ds,$ where C is the line segment from (1, 2) to (3, 5)

7. $\int_C (3x+y)ds,$ where C is the line segment from (5, 2) to (1, 1)

11. $\int_C (3x)ds,$ where C is the quarter-circle $x^2+y^2=4$ from (2, 0) to (0, 2)

15. $\int_C (3y)dx,$ where C is the half-ellipse $x^2+4y^2=4$ from (0, 1) to (0, -1) with $x \geq 0$

17. $\int_C (3y)ds,$ where C is the portion of $y=x^2$ from (0, 0) to (2, 4)

19. $\int_C (2x)dx,$ where C is the portion of $y=x^2$ from (2, 4) to (0, 0)

25. $\int_C (4z)ds,$ where C is the line segment from (1, 0, 1) to (2, -2, 2)

27. $\int_C [4(x-z)z]dx,$ where C is the portion of $y=x^2$ in the plane $z=2$ from (1, 1, 2) to (2, 4, 2)

Compute the work done by the force $\vec{F}$ along the curve C.

29. $\vec{F}(x,y)=\langle 2x, 2y\rangle,$ C is the line segment from (3, 1) to (5, 4)

31. $\vec{F}(x,y)=\langle 2x, 2y\rangle,$ C is the line segment from (4, 0) to (0, 4)

33. $\vec{F}(x,y)=\langle 2, x\rangle,$ C is the portion of $y=x^2$ from (0, 0) to (1, 1)

35. $\vec{F}(x,y)=\langle 3x, 2\rangle,$ C is the line segment from (0, 0) to (0, 1) followed by the line segment to (4, 1)

37. $\vec{F}(x,y,z)=\langle y, 0, z\rangle,$ C is the triangle from (0, 0, 0) to (2, 1, 2) to (2, 1, 0) to (0, 0, 0)

39. $\vec{F}(x,y,z)=\langle xy, 3z, 1\rangle,$ C is the helix $x=\cos t,$ $y=\sin t,$ $z=2t$ and (1, 0, 0) to (0, 1, π)

Use the graph to determine if the work done is positive, negative or zero.

41. (Image in book)
43. (Image in book)
45. (Image in book)

Find the surface area extending from the given curve to the given surface.

59. Above the quarter-circle from (2, 0, 0) to (0, 2, 0) up to the surface $z=x^2+y^2$

61. Above the line segment from (2, 0, 0) to (-2, 0, 0) up to the surface $z=4-x^2-y^2$