

9. (Cont.)

Segment 3

$2 \leq t \leq 3$

$$\vec{r} = \underbrace{3}_{x(t)} \vec{i} + \underbrace{(t-2)}_{y(t)} \vec{j} + \underbrace{2}_{z(t)} \vec{k}$$

$$f(x, y, z) = x + y - z^2$$

$$f(x(t), y(t), z(t)) = 3 + t - 2 - 2^2 = t - 3$$

$$\int_C (x + y - z^2) ds$$

$$= \int_2^3 (t-3) \sqrt{0^2 + 1^2 + 0^2} dt$$

$$= \left[ \frac{1}{2} t^2 - 3t \right]_2^3$$

$$= \frac{1}{2} (3)^2 - 3(3) - \left( \frac{1}{2} (2)^2 - 3(2) \right)$$

$$= \frac{9}{2} - 9 - (2 - 6)$$

$$= \frac{9}{2} - 9 + 4$$

$$= \frac{9}{2} - 5$$

$$= \frac{-1}{2}$$

$$x'(t) = 0$$

$$y'(t) = 1$$

$$z'(t) = 0$$

W/HOLE

$$\frac{9}{2} + \frac{10}{3} - \frac{1}{2}$$

$$4 + \frac{10}{3}$$

$$\frac{20}{3}$$