9. $a(t) = \langle 2, 0, 2t \rangle$ $v(0) = \langle 3, -1, 0 \rangle$

$r(0) = \langle 0, 1, 1 \rangle$

$\int a(t) \, dt = \langle 2t, 0, t^2 \rangle + c$

$c = v(0)$

$v(t) = \langle 2t, 0, t^2 \rangle + \langle 3, -1, 0 \rangle = \langle 3+2t, -1, t^2 \rangle$

$\int v(t) \, dt = \langle 3t + t^2, -t, \frac{1}{3}t^3 \rangle + c$

$c = r(0)$

$r(t) = \langle 3t + t^2, -t, \frac{1}{3}t^3 \rangle + \langle 0, 1, 1 \rangle$

$$\boxed{r(t) = \langle 3t + t^2, 1-t, 1 + \frac{1}{3}t^3 \rangle}$$

10. $f(x,y) = \sqrt{x-2} + \sqrt{y-1}$

$D = \{(x,y) \mid x \geq 2 \land y \geq 1\}$

$D \neq \{(x,y) \mid x < 2 \lor y < 1\}$

(shaded area represents domain)