

Quiz 20

$$1. \int_{C_1} y^2 dx + 3x dy =$$

$$\int_0^3 t^2(-1) + 3(3-t)(1) dt =$$

$$\int_0^3 -t^2 + 9 - 3t dt = -\frac{t^3}{3} + 9t - \frac{3}{2}t^2 \Big|_0^3 =$$

$$-9 + 27 - \frac{27}{2} = -9 + \frac{27}{2} = \frac{9}{2}$$

$$2. C_2: \vec{r}(t) = \langle 3\cos t, 3\sin t \rangle, 0 \leq t \leq \frac{\pi}{2}$$

$$\int_{C_2} y^2 dx + 3x dy =$$

$$\int_0^{\pi/2} (3\sin t)^2(-3\sin t) + 3(3\cos t)(3\cos t) dt$$

$$= 27 \int_0^{\pi/2} -\sin^3 t + \cos^2 t dt$$