Quiz 3, Section A01 Solutions:

Find a parametric equation $\vec{r}(t)$ for the curve given by the intersection of:

$$x^2 + z^2 = 9 \text{ and } y = 5x^2$$

Solution: If we let $x = 3\cos(t)$ and $z = 3\sin(t)$, then $x^2 + y^2 = 9\cos^2(t) + 9\sin^2(t) = 9$. Then $y = 5x^2 = 5(9\cos^2(t)) = 45\cos^2$
So the parametric equation is:

$$\vec{r}(t) = \langle 3\cos(t), 45\cos^2(t), 3\sin(t) \rangle$$