Problem 1: Match function a-f with the appropriate graph A-F.

a. $\vec{r}(t) = \langle t, -t, t \rangle$.

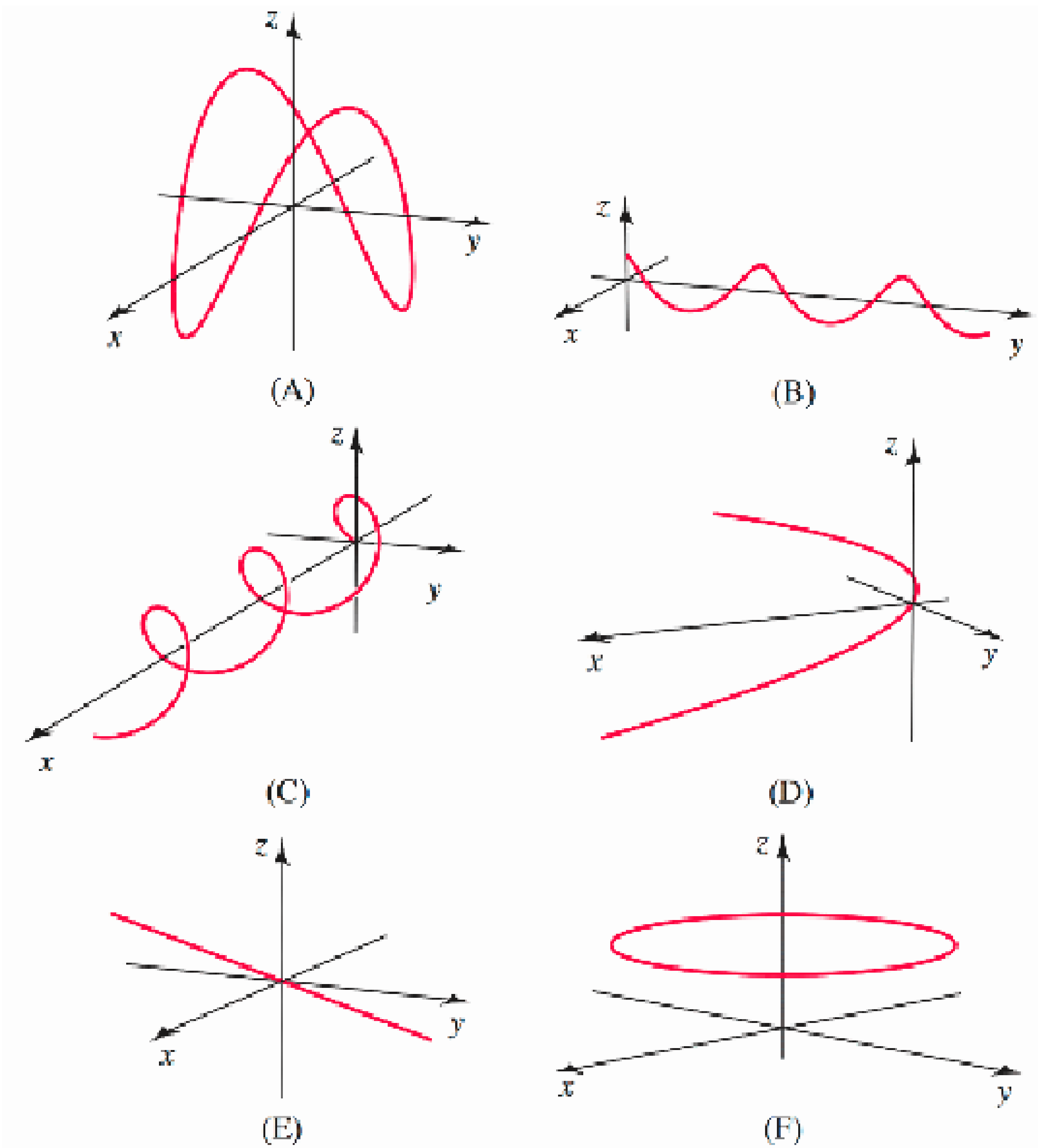
b. $\vec{r}(t) = \langle t^2, t, t \rangle$.

c. $\vec{r}(t) = \langle 4\cos(t), 4\sin(t), 2 \rangle$.

d. $\vec{r}(t) = \langle 2t, \sin(t), \cos(t) \rangle$.

e. $\vec{r}(t) = \langle \sin(t), \cos(t), \sin(2t) \rangle$.

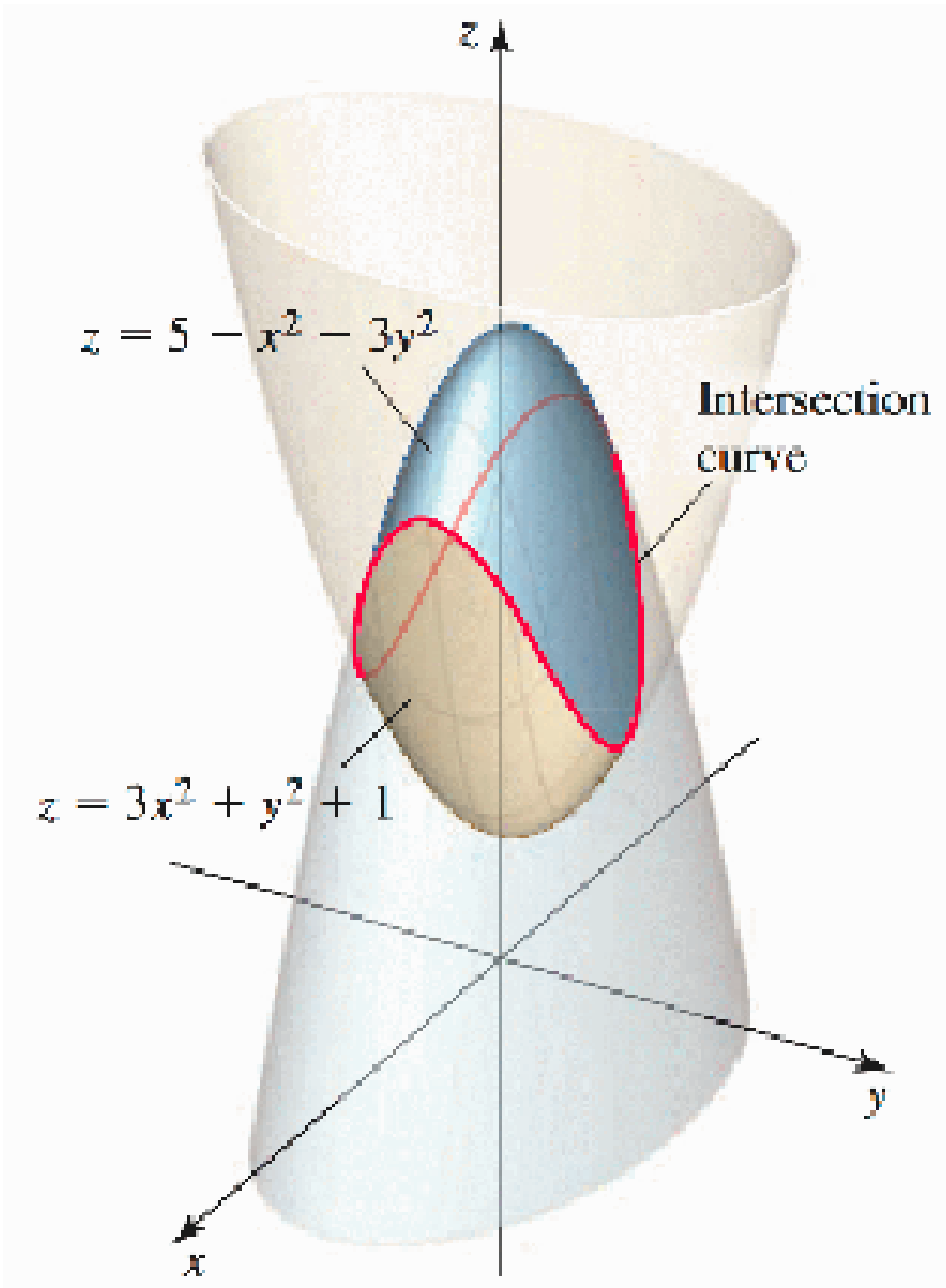
f. $\vec{r}(t) = \langle \sin(t), 2t, \cos(t) \rangle$.



Problem 2: Find an equation of the plane P through the points $\mathrm{R}(5, 3, 7)$, $\mathrm{S}(0, 1, 0)$, and $\mathrm{T}(1, 2, 1)$.

Problem 3: Find a function $\vec{r}(t)$ that describes the curve $\mathcal{C}$ which is the intersection of the surfaces $z = 3x^2 + y^2 + 1$ and $z = 5 - x^2 - 3y^2$. Note that there is not a unique answer to this question since any curve possess infinitely many distinct paramterizations.

$$z = 3x^2 + y^2 + 1; z = 5 - x^2 - 3y^2$$



Problem 4: Determine whether the lines $\vec{r}(t) = \langle 1, 3, 2\rangle + t\langle 6, -7, 1\rangle$ and $R(s) = \langle 10, 6, 14\rangle + s\langle 8, 1, 4\rangle$ are parallel or skew, and find their intersection(s) if any exist.