8. [13 points] For each part of this problem **circle ALL correct answers**. There may be more than one correct answer for each part. You do not need to show your work.

a. [4 points] Which of the following give a parametrization of the **top half** of the unit circle centered at the origin in the xy-plane?

(A) $x = -\sin(t), \quad y = -\cos(t), \quad \frac{\pi}{2} \le t \le \frac{3\pi}{2}.$

(B) $x = \sin(t), \quad y = \cos(t), \quad \frac{\pi}{2} \le t \le \frac{3\pi}{2}.$

(C) $x = t, \quad y = \sqrt{1-t^2}, \quad -1 \le t \le 1.$

(D) $x = \cos(t), \quad y = \sin(t), \quad \pi \le t \le 2\pi.$

(E) NONE OF THESE

b. [4 points] Which of the following points given in polar coordinates are the same point as $(x, y) = (-1, 1)$ in the xy-plane?

(A) $(r, \theta) = (2, \frac{3\pi}{4})$

(B) $(r, \theta) = (-2, \frac{\pi}{4})$

(C) $(r, \theta) = (\sqrt{2}, -\frac{3\pi}{4})$

(D) $(r, \theta) = (-\sqrt{2}, \frac{7\pi}{4})$

(E) NONE OF THESE

c. [5 points] Which of these options make the following statement true?

The series $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{1/2} + n^2 + n^{3/2}}$ ...

(A) Diverges by the limit comparison test when compared to $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{1/2}}$.

(B) Diverges by the comparison test when compared to $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{1/2}}$.

(C) Diverges by the comparison test when compared to $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$.

(D) Converges by the comparison test when compared to $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{3/2}}$.

(E) Converges by the limit comparison test when compared to $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^2}$.

(F) Converges because $\frac{1}{n^{1/2}+n^2+n^{3/2}} \to 0$ as $n \to \infty$.

(G) NONE OF THESE