1. [12 points] Indicate if each of the following is true or false by circling the correct answer. No justification is required.

a. [2 points] In polar coordinates, $(r_1, \theta_1) = (2, \frac{\pi}{5})$ and $(r_2, \theta_2) = (-2, -\frac{4\pi}{5})$ represent the same point.

<div align="right">

True   False

</div>

b. [2 points] If a particle moves according to the parametric equations $x(t) = t^3 + t^2$ and $y(t) = t^4$, then the particle has speed zero at the origin.

<div align="right">

True   False

</div>

c. [2 points] The Taylor series for $f(x) = \sqrt{1 + 2x}$ centered about $x = 0$ converges for $-1 < x < 1$.

<div align="right">

True   False

</div>

d. [2 points] If $P(t)$ is a cumulative distribution function, then the sequence $x_n = P(n)$ converges.

<div align="right">

True   False

</div>

e. [2 points] The sequence $a_n = \int_{\frac{1}{n}}^{1} \frac{1}{x^3}\,dx$ converges.

<div align="right">

True   False

</div>

f. [2 points] The function $F(x) = \int_{1}^{x^2} \sin(t^2)\,dt$ is an even function.

<div align="right">

True   False

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