

8. [12 points] Circle **all** that apply. You do not need to provide an explanation for your answer.

a. [3 points] Which of the following are parameterizations for the circle of radius 2 centered at the origin for $0 \leq t \leq \pi$?

$x = \cos(2t), \quad y = \sin(2t)$

$x = \sqrt{2} \cos(t), \quad y = \sqrt{2} \sin(t)$

$x = 2 \cos(2t), \quad y = -2 \sin(2t)$

b. [3 points] Which of the following are antiderivatives of e^{-x^4} ?

$\int_1^{x^4} e^{-t} dt$

$\int_1^x e^{-t^4} dt$

$-\frac{1}{2} \int_{2x}^1 e^{-t^4/16} dt$

c. [3 points] Suppose that $F(x)$ is an odd function which is concave down and increasing for $x \geq 0$. Which of the following approximations is certain to give an overestimate for $\int_{-2}^1 F(x) dx$?

LEFT(4)

RIGHT(4)

TRAP(3)

d. [3 points] The integral $\int_0^1 4\pi z^2(1 - z^2) dz$ gives the volume of which of the following solids of revolution?

The region bounded by $y = 2x\sqrt{1 - x^2}$ and $y = 0$ rotated about the x -axis.

The region bounded by $y = 0$, $x = 1$ and $y = 2x^2(1 + x)$ rotated about line $x = 1$.

The region bounded by $x = 2y$ and $x = 2y^2$ rotated about the y -axis.