Full name: _____ Key _____   **GT ID:**_____ **Sec:**___

Quiz 9 Version A

You have 15 minutes to take the quiz. No phones, notes, or use aids of any kind is permitted.
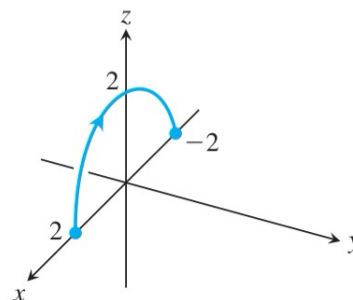
1. (4 points) [**Parameterizations of Curves and Line Integrals**] *True or False.*

   (a) If C_1 and C_2 are two curves with the same starting point and ending point, then $\int_{C_1} f(x,y)\,ds = \int_{C_2} f(x,y)\,ds$.   [A]

   ○ **TRUE**   ● **FALSE**

   (b) Find a parameterization for space curve C which is the the half circle in the xz-plane with $z \geq 0$ shown in the image.   [AN]

   $$r(t) = \langle 2\cos t, 0, 2\sin t \rangle,\ t \in [0,\pi]$$

2. (6 points) [**Line Integrals of Scalar Functions**]
   Evaluate the line integral where C is the line segment from $(0,0,0)$ to $(2,2,2)$ shown below.   [AJN]

   $$A = \int_C \sqrt{x + 2y + z}\,ds, \quad C:\ \mathbf{r}(t) = \langle t, t, t \rangle, t \in [0, 2].$$

   $r(t) = \langle t, t, t \rangle \quad t \in [0,2]$

   $r'(t) = \langle 1, 1, 1 \rangle \quad |v| = \sqrt{3}$

   $\int_0$

   $A = \int_0^2 \sqrt{t + 2t + t}\ \sqrt{3}\,dt$

   $= \int_0^2 \sqrt{4t}\ \sqrt{3}\,dt = \int_0^2 2\sqrt{3}\,\sqrt{t}\,dt = 2\sqrt{3}\cdot\frac{2}{3}t^{3/2}\Big|_0^2$

   $= \frac{4\sqrt{3}}{3}(2\sqrt{2} - 0)$

   $= \boxed{\dfrac{8\sqrt{6}}{3}}$