Math 3550 Quiz 1 Form A   Feb 7, 2020

1.) Circle T for true and F for false.

[4] 1a.) If $\vec{a}$ and $\vec{b}$ are vectors in $\mathbb{R}^3$, then $\vec{a} \times \vec{b} = -(\vec{b} \times \vec{a})$. T F

[4] 1b.) The arc length s along the smooth curve with poisition vector $\vec{r}(t) = x(t)\vec{i} + y(t)\vec{j} + z(t)\vec{k}$ from $\vec{r}(a)$ to $\vec{r}(b)$ is, by definition

$$s = \int_a^b \sqrt{[x'(t)]^2 + [y'(t)]^2 + [z'(t)]^2} dt$$ T F

2.) Determine whether or not the four points $A(5, 2, -3)$, $B(6, 4, 0)$, $C(7, 5, 1)$, and $D(14, 14, 18)$ are coplanar. If not find the volume of the parallelepiped spanned by $\overrightarrow{AB}$, $\overrightarrow{AC}$, and $\overrightarrow{AD}$.

Math 3550 Quiz 1 Form B   Feb 7, 2020

1.) Circle T for true and F for false.

[4] 1a.) The partial derivative value $f_x(a, b)$ is the slope of a line tangent to a curve on which y is constant and which passes through the point $(a, b, f(a, b))$ on the surface $z = f(a, b)$. T F

[4] 1b.) The graph of the function $f(x, y) = 2 - 3x + 4y$ is a plane. T F

[12] 2.) Find the unit tangent and normal vectors to the curve $y = x^3$ at the point (-1, -1).

Math 3550 Quiz 1 Form C   Feb 7, 2020

1.) Circle T for true and F for false.

[4] 1a.) An equation for the plane through the three points (2, 4, -3), (3, 7, -1), (4, 3, 0) is $11x + y - 7z = 56$ T   F

[4] 1b.) If the cost function $C(x, y)$ of a box with base of length x and height y is given by

$$C(x, y) = 0.1(xy + \frac{100}{y} + \frac{100}{x})$$

then C is an independent variable and x and y are dependent variables.   T   F

[12] 2.) Find the arc length of the curve $x = sin(2t)$, $y = cos(2t)$, $z = 8t$ from $t = 0$ to $t = \pi$.