
1.(1 pt)

If $\mathbf{r}(t) = (\sqrt{t+4})\mathbf{i} + \frac{t^2-4}{t-2}\mathbf{j} + \sin(5\pi t)\mathbf{k}$.

Then

$\lim_{t\to 1}\mathbf{r}(t)=$ _____ **i**+ _____ **j**+ _____ **k**.

2.(1 pt)

The curve (x=cost, y=sint, z=t) lies on which of the following surfaces.

Enter T or F depending on whether the statement is true or false. (You must enter T or F – True and False will not work.)

__ 1. a circular cylinder
__ 2. a sphere
__ 3. a plane
__ 4. an elliptic paraboloid

3.(1 pt)

For the given position vectors $\mathbf{r}(t)$ compute the tangent velocity vector $\mathbf{r}'(t)$ for the given value of t .

A.)

If $\mathbf{r}(t) = (\cos 3t, \sin 3t)$

Then $\mathbf{r}'(\frac{\pi}{4})=$ (_____ , _____)

B.)

If $\mathbf{r}(t) = (t^2, t^3)$

Then $\mathbf{r}'(5)=$ (_____ , _____)

C.)

If $\mathbf{r}(t) = e^{3t}\mathbf{i} + e^{-5t}\mathbf{j} + t\mathbf{k}$.

Then $\mathbf{r}'(2)=$ _____ **i**+ _____ **j**+ _____ **k** .

4.(1 pt)

For the given position vectors $\mathbf{r}(t)$ compute the unit tangent vector $\mathbf{T}(t)$ for the given value of t .

A.)

If $\mathbf{r}(t) = (\cos 2t, \sin 2t)$

Then $\mathbf{T}(\frac{\pi}{4})=$ (_____ , _____)

C.)

If $\mathbf{r}(t) = (t^2, t^3)$

Then $\mathbf{T}(4)=$ (_____ , _____)

C.)

If $\mathbf{r}(t) = e^{2t}\mathbf{i} + e^{-4t}\mathbf{j} + t\mathbf{k}$.

Then $\mathbf{T}(1)=$ _____ **i**+ _____ **j**+ _____ **k** .

5.(1 pt)

Find parametric equations for the tangent line at the point $(\cos(\frac{3\pi}{6}), \sin(\frac{3\pi}{6}), \frac{3\pi}{6}))$ on the curve $x = \cos t,\ y = \sin t,\ z = t$

$x(t) =$ _____

$y(t)=$ _____

$z(t)=$ _____

6.(1 pt)

Evalute

$\int_0^1 (t\mathbf{i} + t^2\mathbf{j} + t^3\mathbf{k})dt =$ _____ **i**+ _____ **j**+ _____ **k**.

7.(1 pt) If $\mathbf{r}(t) = \cos(1t)\mathbf{i} + \sin(1t)\mathbf{j} - 10t\mathbf{k}$

compute $\mathbf{r}'(t)=$ _____ **i**+ _____ **j**+ _____ **k**

and $\int \mathbf{r}(t)\,dt=$ _____ **i**+ _____ **j**+ _____ **k**

8.(1 pt)

A particle in space undergoes a constant nonzero acceleration. Depending on the circumstances, the particle's trajectory can be held by the following curves.

Enter T or F depending on whether the statement is true or false. (You must enter T or F – True and False will not work.)

__ 1. a parabola
__ 2. a hyperbola
__ 3. an ellipse
__ 4. a circle
__ 5. a strait line

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