

Students are expected to complete homework assignments on their own before referring to the following pages. The answers and hints are designed to check work and clarify problems. The original intent of the layout was for display in class after assignments had been completed. Students should use the following information as help to understand the exercises and master the concepts.

Calculus D

Chapter 13

Even Answers & Hints
for Homework

13.2 + 13.4 Even Answers

13.2 (18) $\vec{T}(1) = \frac{2}{3}\hat{i} + \frac{2}{3}\hat{j} + \frac{1}{3}\hat{k}$

(20) $\vec{T}\left(\frac{\pi}{4}\right) = \frac{1}{2}\hat{i} - \frac{1}{2}\hat{j} + \frac{1}{\sqrt{2}}\hat{k}$

(24) $x = t + 1, y = t, z = t$

(26) $x = t, y = t + 2, z = 2t + 1$

(28) $x = -t + \sqrt{3}, y = \sqrt{3}t + 1, z = -4\sqrt{3}t + 2$

13.4

(18a) $\vec{r}(t) = \frac{1}{6}t^3\hat{i} + (e^t - t)\hat{j} + (e^{-t} + 2t)\hat{k}$

13.3 and 13.4 Even Answers

13.3

$$\begin{aligned} (44) \quad \vec{T}(t) &= \langle -\sin t \cos t, \cos^2 t, -\sin t \rangle \\ \vec{T}(0) &= \langle 0, 1, 0 \rangle \\ \vec{N}(0) &= \langle -\frac{1}{\sqrt{2}}, 0, -\frac{1}{\sqrt{2}} \rangle \end{aligned}$$

13.4

$$(34) \quad a_T = \frac{4t-4}{\sqrt{4t^2-8t+5}}, \quad a_N = \frac{2}{\sqrt{4t^2-8t+5}}$$

$$(36) \quad a_T = \frac{4t}{\sqrt{4t^2+10}}, \quad a_N = \frac{2\sqrt{10}}{\sqrt{4t^2+10}}$$

$$(38) \quad a_T = \frac{4\sin 2t \cos 2t}{\sqrt{1+2\sin^2 2t}}, \quad a_N = \frac{2\sqrt{2}|\cos 2t|}{\sqrt{1+2\sin^2 2t}}$$

← Part II

13.3 Even Answers

$$\begin{aligned} \textcircled{14} \quad \vec{r}(s) = & \left(\frac{s}{\sqrt{2}} + 1 \right) \cos \left(\ln \left(\frac{s}{\sqrt{2}} + 1 \right) \right) \hat{i} \\ & + 2 \hat{j} \\ & + \left(\frac{s}{\sqrt{2}} + 1 \right) \sin \left(\ln \left(\frac{s}{\sqrt{2}} + 1 \right) \right) \hat{k} \end{aligned}$$

$$t = \frac{1}{2} \ln \left(\frac{s}{\sqrt{2}} + 1 \right)$$