WebAssign
Hw 5 (13.1): Vector Functions and Space Curves (Homework)

Yinglai Wang
MA 261 Fall 2012, section 121, Fall 2012
Instructor: David Daniels

Current Score : 20 / 20 **Due :** Thursday, August 30 2012 11:00 PM EDT

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

View Key

1. 3.33/3.33 points | Previous Answers SCalcET7 13.1.001.MI.

Find the domain of the vector function. (Enter your answer using interval notation.)

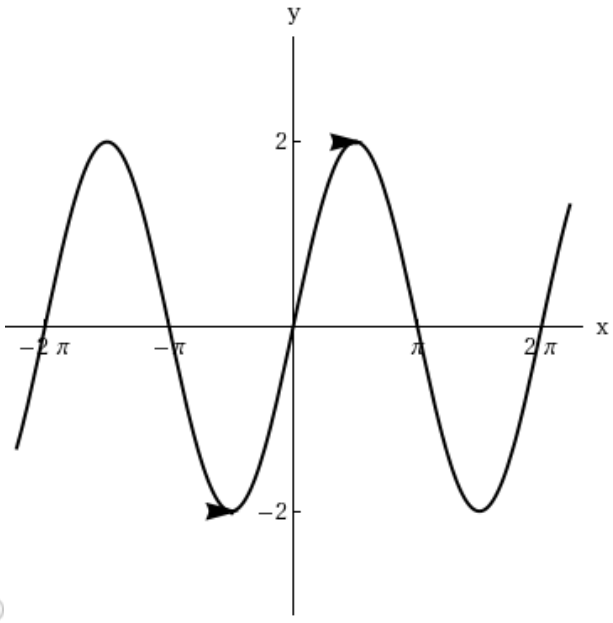
$\mathbf{r}(t) = \langle \sqrt{36 - t^2}, e^{-3t}, \ln(t + 3) \rangle$

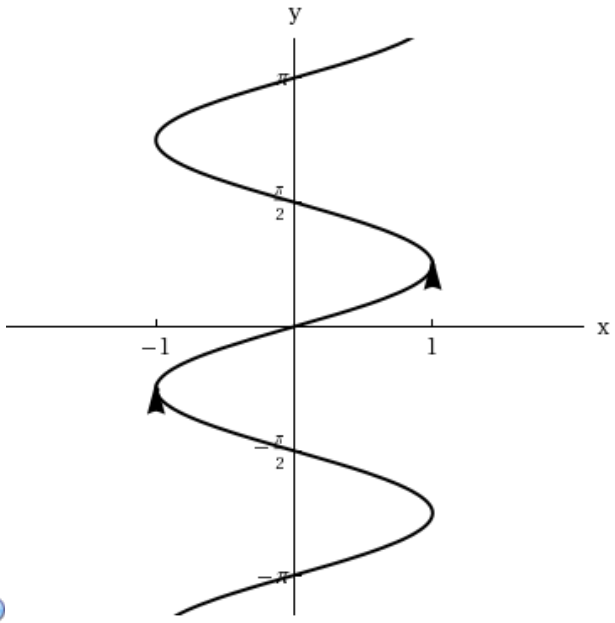
Need Help? Read It Watch It Master It Chat About It

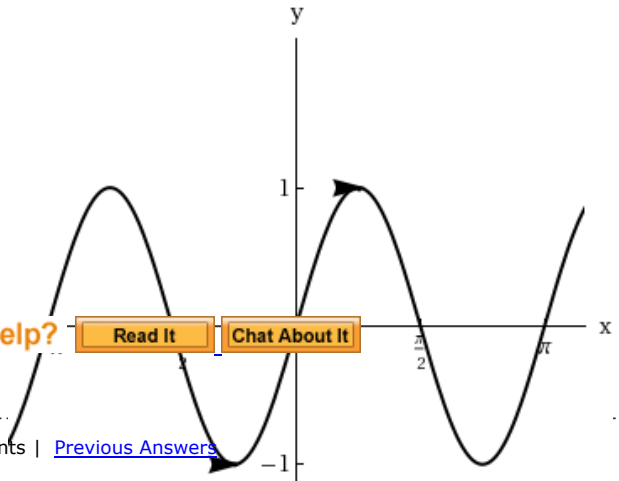
2. 3.33/3.33 points | Previous Answers SCalcET7 13.1.007.

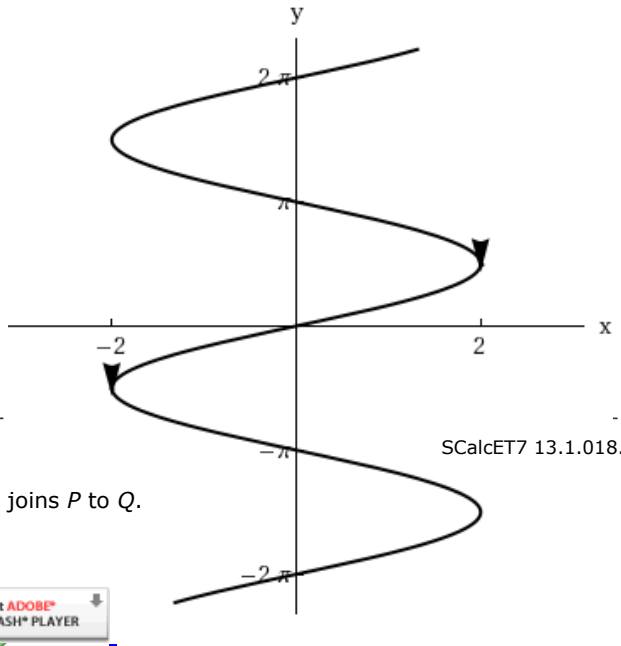
Sketch the curve with the given vector equation. Indicate with an arrow the direction in which t increases.

$\mathbf{r}(t) = \langle \sin 2t, t \rangle$









Need Help? Read It Chat About It

3. 3.33/3.33 points | Previous Answers SCalcET7 13.1.018.

Find a vector equation and parametric equations for the line segment that joins P to Q.

$P(1, -1, 4)$, $Q(4, 8, 1)$

vector equation $\mathbf{r}(t) =$ Flash Player version 10 or higher is required for this question. You can get Flash Player free from Adobe's website.

parametric equations $(x(t), y(t), z(t)) =$ Flash Player version 10 or higher is required for this question. You can get Flash Player free from Adobe's website.

Need Help? Read It Watch It Chat About It

4. 3.33/3.33 points | Previous Answers SCalcET7 13.1.029.MI.

At what points does the curve $\mathbf{r}(t) = t\mathbf{i} + (6t - t^2)\mathbf{k}$ intersect the paraboloid $z = x^2 + y^2$? (If an answer does not exist, enter DNE.)

$(x, y, z) =$ Flash Player version 10 or higher is required for this question. You can get Flash Player free from Adobe's website. (smaller t-value)

$(x, y, z) =$ Flash Player version 10 or higher is required for this question. You can get Flash Player free from Adobe's website. (larger t-value)

Need Help? Read It Watch It Master It Chat About It

5. 3.33/3.33 points | Previous Answers SCalcET7 13.1.047.

If two objects travel through space along two different curves, it's often important to know whether they will collide. (Will a missile hit its moving target? Will two aircraft collide?) The curves might intersect, but we need to know whether the objects are in the same position *at the same time*. Suppose the trajectories of two particles are given by the vector functions

$$\mathbf{r}_1(t) = \langle t^2, 11t - 18, t^2 \rangle \qquad \mathbf{r}_2(t) = \langle 15t - 54, t^2, 16t - 63 \rangle$$

for $t \geq 0$. Find the values of t at which the particles collide. (Enter your answers as a comma-separated list. If an answer does not exist, enter DNE.)

t =

Get ADOBE FLASH PLAYER

Flash Player version 10 or higher is required for this question.
You can get Flash Player free from Adobe's website.

Need Help? Read It Watch It Chat About It

6. 3.35/3.35 points | Previous Answers SCalcET7 13.1.048.

Two particles travel along the space curves

$$\mathbf{r}_1(t) = \langle t, t^2, t^3 \rangle \qquad \mathbf{r}_2(t) = \langle 1 + 4t, 1 + 16t, 1 + 52t \rangle.$$

Find the points at which their paths intersect. (If an answer does not exist, enter DNE.)

(x, y, z) =

Get ADOBE FLASH PLAYER

Flash Player version 10 or higher is required for this question.
You can get Flash Player free from Adobe's website.

(smaller t-value)

(x, y, z) =

Get ADOBE FLASH PLAYER

Flash Player version 10 or higher is required for this question.
You can get Flash Player free from Adobe's website.

(larger t-value)

Find the points where the particles collide. (Enter your answers as a comma-separated list. If an answer does not exist, enter DNE.)

t =

Get ADOBE FLASH PLAYER

Flash Player version 10 or higher is required for this question.
You can get Flash Player free from Adobe's website.

Need Help? Read It Chat About It