Web**Assign**
Hw 7 (13.3): Arc Length and Curvature (Homework)

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

Current Score : 20 / 20   **Due :** Thursday, September 6 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

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1. 2.85/2.85 points | Previous Answers   SCalcET7 13.3.001.MI.

Find the length of the curve.

$$\mathbf{r}(t) = \langle 7t,\ 3\cos t,\ 3\sin t \rangle, \quad -4 \le t \le 4$$

✔

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2. 2.85/2.85 points | Previous Answers   SCalcET7 13.3.003.

Find the length of the curve.

$$\sqrt{2}\,t\mathbf{i} + e^t\mathbf{j} + e^{-t}\mathbf{k}, \quad 0 \le t \le 4$$

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3. 2.85/2.85 points | Previous Answers   SCalcET7 13.3.006.

Find the length of the curve.

$$\mathbf{r}(t) = 3t\,\mathbf{i} + 8t^{3/2}\,\mathbf{j} + 12t^2\,\mathbf{k}, \quad 0 \le t \le 1$$

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4. 2.85/2.85 points | Previous Answers   SCalcET7 13.3.013.

Reparametrize the curve with respect to arc length measured from the point where $t = 0$ in the
direction of increasing t. (Enter your answer in terms of s.)

$$\mathbf{r}(t) = 4t\,\mathbf{i} + (9 - 2t)\,\mathbf{j} + (6 + 3t)\,\mathbf{k}$$

$\mathbf{r}(t(s)) =$

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5. 2.85/2.85 points | Previous Answers   SCalcET7 13.3.017.MI.

Consider the vector function given below.

$$\mathbf{r}(t) = \langle 9t, \, 4 \cos t, \, 4 \sin t \rangle$$

(a) Find the unit tangent and unit normal vectors **T**(*t*) and **N**(*t*).

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N(*t*) =   Flash Player version 10 or higher is required for this question.
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(b) Use this formula to find the curvature.

κ(*t*) =

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6. 2.85/2.85 points | [Previous Answers](#)   SCalcET7 13.3.018.

Consider the following vector function.

$$\mathbf{r}(t) = \langle 7t^2, \sin t - t\cos t, \cos t + t\sin t\rangle, \quad t > 0$$

(a) Find the unit tangent and unit normal vectors $\mathbf{T}(t)$ and $\mathbf{N}(t)$.

$\mathbf{T}(t) = $ Flash Player version 10 or higher is required for this question.
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✔

$\mathbf{N}(t) = $ Flash Player version 10 or higher is required for this question.
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(b) Use [this formula](#) to find the curvature.

$\kappa(t) = $

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7. 2.9/2.9 points | Previous Answers

SCalcET7 13.3.019.

Consider the following vector function.

$$\mathbf{r}(t) = \left\langle 6\sqrt{2}\,t,\ e^{6t},\ e^{-6t} \right\rangle$$

(a) Find the unit tangent and unit normal vectors **T**(t) and **N**(t).

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N(t) =   Flash Player version 10 or higher is required for this question.
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(b) Use this formula to find the curvature.

$\kappa(t)$ =

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