WebAssign
10.3 (Homework)

Current Score : – / 100 **Due :** Monday, June 26 2017 11:59 PM CDT

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1. –/10 pointsLarCalcET6 10.3.001.

Find dy/dx.

$$x = t^2, \quad y = 5 - 2t$$

$$\frac{dy}{dx} =$$

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2. –/10 pointsLarCalcET6 10.3.005.

Find dy/dx and d^2y/dx^2, and find the slope and concavity (if possible) at the given value of the parameter. (If an answer does not exist, enter DNE.)

Parametric Equations	*Point*
$x = 9t, \quad y = 6t - 5$	$t = 2$

$$\frac{dy}{dx} =$$

$$\frac{d^2y}{dx^2} =$$

slope

concavity:

---Select---

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3. –/10 pointsLarCalcET6 10.3.009.MI.SA.

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

Find dy/dx and d^2y/dx^2, and find the slope and concavity (if possible) at the given value of the parameter.

Parametric Equations	*Point*
$x = 4\cos\theta,\ \ y = 4\sin\theta$	$\theta = \frac{\pi}{4}$

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4. –/10 pointsLarCalcET6 10.3.017.

Find an equation of the tangent line at each given point on the curve.

$x = t^2 - 4, \quad y = t^2 - 2t$

at (0, 0)

at (−3, −1)

at (−3, 3)

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5. –/10 pointsLarCalcET6 10.3.026.

Find the equations of the tangent lines at the point where the curve crosses itself.

$$x = t^3 - 6t$$
$$y = t^2$$

$y =$

(negative slope)

$y =$

(positive slope)

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6. –/10 pointsLarCalcET6 10.3.029.

Find all points (if any) of horizontal and vertical tangency to the curve. Use a graphing utility to confirm your results. (If an answer does not exist, enter DNE.)

$x = 5 - t, \quad y = t^2$

Horizontal tangent

$(x, y) =$ (

)

Vertical tangent

$(x, y) =$ (

)

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7. –/10 pointsLarCalcET6 10.3.043.

Determine the open t-intervals on which the curve is concave downward or concave upward. (Enter your answer using interval notation.)

$x = \sin t, \quad y = \cos t, \quad 0 < t < \pi$

Concave upward

Concave downward

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8. –/10 pointsLarCalcET6 10.3.047.

Find the arc length of the curve on the given interval. (Round your answer to two decimal places.)

Parametric Equations	**Interval**
$x = e^{-t}\cos t, \quad y = e^{-t}\sin t$	$0 \le t \le \frac{\pi}{2}$

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9. –/10 pointsLarCalcET6 10.3.065.

Find the area of the surface generated by revolving the curve about each given axis.

$x = 3t, \quad y = 3t, \quad 0 \le t \le 5$

(a) x-axis

(b) y-axis

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10. –/10 pointsLarCalcET6 10.3.081.

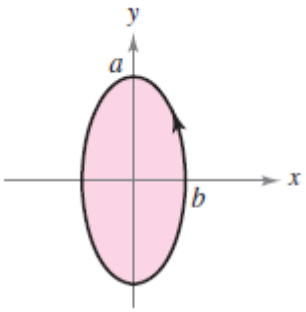
If y is a continuous function of x on the interval $a \le x \le b$, where $x = f(t)$ and $y = g(t)$, then

$$\int_a^b y\,dx = \int_{t_1}^{t_2} g(t)f'(t)\,dt$$

where $f(t_1) = a$, $f(t_2) = b$, and both g and f' are continuous on $[t_1, t_2]$.

Use a computer algebra system and the result above to match the closed curve with its area.†

Ellipse: $(0 \le t \le 2\pi)$
$x = b \cos t$
$y = a \sin t$



- $\frac{2}{5}-ab$
- $\frac{5}{2}-\pi a^2$
- $2\pi a^2$
- πab
- $2\pi ab$
- $6\pi a^2$

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