Arrival Instructions

- Divide into 2 teams (5 people vs 6 people)
- Create a Team Name
- Discuss HW Questions with group

HW Questions?

Tic-Tac-Toe Review

1. If a particle has a velocity vector of, $< t^2, \sin \pi t >$

the acceleration at t = 1 is…

$< 2, -\pi >$

2. Write an equation, in standard form, of the line tangent to the curve with parametric equations

$x = 3e^{-t} \quad and \quad y = 6e^{t}$

$at \quad t = 0$

$2x + y = 12$

3. Which of the following is/are true about this limit statement?

$$\lim_{x\to 5}\frac{g(x)-g(5)}{x-5}=0$$

A) $g(x)$ *must be continuous at* $x=5$

B) $g(5)=0$

C) $g'(5)=0$

D) *There is an extrema at* $x=5$

4. In the ***xy plane***, what would be

The equation that represents the graph described by

$$x=2t+4 \qquad y=4t$$

$$y=2x-8$$

5. A particle's position

Is described by:

$$r(t)=(\cos t)i+(t)j$$

Give its velocity at time π

$$0i+1j \qquad or \quad \langle 0,1\rangle$$

6. Determine any asymptotes and/or holes of the following function:

$$f(x)=\frac{x-2}{x^2-4}$$

$Vertical: \quad x=-2$

$Horizontal: \quad y=0$

$Hole: \quad x=2$

7. Given the points A=(3, 5),

B=(-2, 0), and C=(-7, -4), find

$$\overrightarrow{AB}+\overrightarrow{CB}$$

$$\langle 0,-1\rangle$$

8. Find $\frac{d^2y}{dx^2}$ for the parametric curve defined by:

$$x=e^t \quad and \quad y=\sin t$$

$$\frac{d^2y}{dx^2}=\frac{-\sin t-\cos t}{e^{2t}}$$

9. A curve in the xy plane is

defined parametrically by the equations

$$x=t^2+t \quad and \quad y=t^2-t$$

At what point(s) on this curve are there horizontal tangents?

$$\left(\frac{3}{4},-\frac{1}{4}\right)$$

10. Given the points A=(3, 5),

B=(-2, 0), and C=(-7, -4), find and write $\overrightarrow{BC}$ as a linear combination.

$$-5i-4j$$

11. If a particle has a position

At any time t of

$$r(t) = (e^{-t})i + (t^2)\,j$$

Find its speed at t = 0.

$$speed = 1$$

12. A particle moves in the xy-plane so that at any time t its coordinates are

$$x = t^2 \quad and \quad y = 4 - t^3$$

What is the particle's direction when *t=1*

$$\left\langle \frac{2}{\sqrt{13}}, -\frac{3}{\sqrt{13}} \right\rangle$$

13. A particle moves in the xy-plane so that at any time t its coordinates are

$$x = t^2 \quad and \quad y = 4 - t^3$$

Find the acceleration vector:

$$\langle 2, -6t \rangle$$

14. Find the UNIT vector(s)

normal to the curve

$$x = \ln(t-1) \quad y = \ln(t) - 1 \quad at\ t = 3$$

$$\left\langle \frac{-2}{\sqrt{13}}, \frac{3}{\sqrt{13}} \right\rangle \ and \ \left\langle \frac{2}{\sqrt{13}}, \frac{-3}{\sqrt{13}} \right\rangle$$

15. Eliminate the parameter and

Give the equation of the curve

$x = t^2 \text{ and } y = t + 1$

In terms of x and y.

$y = \pm\sqrt{x} + 1 \qquad (parabola)$

$or\ x = (y-1)^2$

16. Find the length of the ellipse

$x = 3\cos t, \quad y = 4\sin t, \quad 0 \le t \le 2\pi$

$$\int_0^{2\pi} \sqrt{(-3\sin t)^2 + (4\cos t)^2}\, dt$$

$= 22.103$

17. Find the component form of

vector $-4\overrightarrow{AB}$

if A=(-2, 4) and B = (5, 3)

$\langle -28, 4 \rangle$

18. Integrate:

$$\int_0^{\pi/4} \tan x \sec^2 x \, dx$$

$\frac{1}{2}$

19. Two particles move in the xy-plane according to the equations

$$x = t - 2 \quad and \quad y = (t-2)^2$$

Set up an integral that gives the distance traveled by the particle from t = 0 to t = 3.

$$D = \int_0^3 \sqrt{1^2 + (2t-4)^2}\, dt$$

20. A particle move in the xy-plane according to the equations

$$x = t - 2 \quad and \quad y = (t-2)^2$$

Find the *point(s)* where the particle has vertical and horizontal tangents.

No Vertical Tangents

Horizontal Tangent at $t = 2$ $(0,0)$

Reminders

- Test TOMORROW
  - 72 minutes for 4 sections
  - Includes review of AB Topics
  - Study Guide on Edmodo
  - Tutoring after school today
- Unit HW Packet due tomorrow