LESSON 6 MA 26100-FALL 2023

DR. HOOD

LESSON 6 - WARM UP

(Fall 16 Exam 1 #4) Let (a, b, c) be the point of intersection of the curve $\vec{r}(t) = \langle \sqrt{2}t, t^2 + 1, 1 - 4t \rangle$ with the surface $x^2 + 2y - z = 0$. What is the value of $a^2 + 2b$?

$$\chi^{2} + 2y - \overline{z} = 0$$

$$(-72t)^{2} + a(+2t) - (1-4t) = 0$$

$$2t^{2} + 2t^{2} + a - 1 + 4t = 0$$

$$4t^{2} + 4t + 1 = 0 = \hat{c}(\frac{1}{2})$$

$$(-2t+1)^{2} = 0 = (-72(-1)^{2}+1)$$

(a) 3
b) 4

$$2t^2 + 2t^2 + 3 - 1$$

c) 5
 $4t^2 + 4t + 1$
d) 6 $a^2 + 7b = (2t + 1)^2 = (2t + 1)^2 = (-\frac{2}{2})^2 + 2(\frac{1}{4})^2 = \frac{1}{4} = 3$
 $(-\frac{2}{2})^2 + 2(\frac{1}{4})^2 = \frac{1}{4} = 3$
 $(-\frac{2}{2})^2 + 2(\frac{1}{4})^2 = \frac{1}{4} = 3$

LABOR DAY HOLIDAY

- Labor Day Holiday is Monday Sep 4, 2023
 - No lecture on Monday
 - No HW due Monday
 - No Office Hours on Monday
 - Math Resource Room is closed

QUIZ RUBRIC

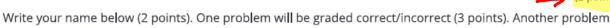
- Quiz Grading:
 - (2 points) Write your name on the paper
 - (3 points) Multiple Choice Question
 - (5 points) Partial Credit Question
 - Must show your work to receive full credit
 - If you just write D, you will earn 1 point, even if D is the correct choice

• Link to Quiz Rubric:

https://www.math.purdue.edu/~kthood/docs/MA261 Fall2023/rubric quizzes ma261 fa23 update 9-1-23.pdf

Problem 1





Quiz Grading:

- (2 points) Write your name on the paper
- (3 points) Multiple Choice Question
- (5 points) Partial Credit Question
 - Must show your work to receive full credit
 - If you just write D, you will earn 1
 point, even if D is the correct
 choice

Problem 2

(3 pc

The area of the triangle with vertices (2, 1, 1), (1, 2, 1), (1, 1, 2) is

will be graded for partial credit based on work shown (5 points).

A. 3/2

B. $\sqrt{2}$

C. 2

D. 7/2

E. $\frac{\sqrt{3}}{2}$

Problem 3



A line l passes through the points A(1,-2,1) and B(2,3,-1). At what point does this line intersect with the xy -plane?

To receive the full 5 points, you must show all your work on this problem.

A.
$$\left(\frac{5}{2}, \frac{-1}{2}, 0\right)$$

B.
$$\left(\frac{5}{2}, \frac{1}{2}, 0\right)$$

c.
$$\left(\frac{3}{2}, \frac{1}{2}, 0\right)$$

D.
$$\left(\frac{3}{2}, \frac{-1}{2}, 0\right)$$

E.
$$(\frac{3}{2}, -1, 0)$$

POLL 1

Find the unit tangent vector of

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

a)
$$\vec{T}(t) = \frac{1}{\sqrt{5}} \langle -\sin(t), \cos(t), 2 \rangle$$

$$= \sqrt{1 + 4}$$

b)
$$\vec{T}(t) = \left\langle -\frac{1}{\sqrt{5}}, \frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}} \right\rangle$$

c)
$$\vec{T}(t) = \langle -\sin(t), \cos(t), 2 \rangle$$

POLL 2

$$F(t) = \langle 2t-1, t^2, t^2-2 \rangle = \langle 3, 4, 3 \rangle$$

$$2t-1=3$$

$$t=2$$

(Spring 18 Exam 1 #2) If L is the tangent line to the curve $\vec{r}(t) = \langle 2t - 1, t^2, t^2 - 2 \rangle$ at (3,4,2), find the point where L intercepts the xy-plane.

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tangent vector:
                      デ(t=2) = イマ, at, 2t) t=a
a) (2,1,0)
                                = < 2, 4, 4) direction vector
b) (1,2,0)
                      <x, 4, 27 = <3, 4, 27 + t <2, 4, 47
(2,-2,0)
                               = (3+at, 4+4t, 2+4t)
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MUDDIEST POINT

What was the muddiest point from today's lecture?

- a) Derivatives of Vector-Valued Functions
- b) Tangent Vector
- c) Unit Tangent Vector
- d) Integrals of Vector-Valued Functions
- e) None understood everything today