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JT

Solutions
Final Exam 210
Winter 2020
Temple

① $A \cdot B = \overrightarrow{(2, -1, 1)} \cdot \overrightarrow{(1, 1, 2)} = 2 \cdot 1 - 1 \cdot 1 + 1 \cdot 2 = 3$

②

$A \times B = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & -1 & 1 \\ 1 & 1 & 2 \end{vmatrix} = \hat{i}(-2-1) - \hat{j}(4-1) + \hat{k}(2+1)$
 $= \overrightarrow{(-3, -3, 3)} = 3 \overrightarrow{(-1, -1, 1)}$

③

$\nabla f = \lambda \nabla g$ or $\nabla g = \lambda \nabla f = \lambda \overrightarrow{(-2, 3, -1)}$

④

$\nabla f = ((y-2)^2, x(y-2))$, $H = \begin{bmatrix} 0 & 2(y-2) \\ 2(y-2) & x \end{bmatrix}$

$\text{Det } H = -4(y-2)^2$ Critical pts $y=2, x \in \mathbb{R}$
only inflection pt (a)

$$\text{Det} H = 0 \text{ @ } y=2 \Rightarrow \text{sing}$$