

Please show **all** your work! Answers without supporting work will not be given credit.  
Write answers in spaces provided.

Name: \_\_\_\_\_

1. [5 pts] Find the discriminant of

$$f(x, y) = e^x \sin(y)$$

Simplify your answer. Note:  $\sin^2(y) + \cos^2(y) = 1$ .

$$D(x, y) = \underline{\hspace{10em}}$$

2. [5 pts] Given the information in the table below, find and classify any critical points for the function  $g(x, y)$ .

$(x_0, y_0)$	$g(x_0, y_0)$	$g_x(x_0, y_0)$	$g_y(x_0, y_0)$	$g_{xx}(x_0, y_0)$	$g_{xy}(x_0, y_0)$	$g_{yy}(x_0, y_0)$
(0, 1)	0	3	0	0	-2	4
(4, 3)	-3	0	0	-1	2	-6
(2, 7)	15	0	0	4	5	8
(5, 6)	4	0	0	3	5	2
(-2, 8)	2	0	0	2	2	2

Answer: \_\_\_\_\_