

Homework00

Corley Herman

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Question 1:

$$g(x) = -3x^2 + 24x - 30$$

$$-6x + 24 = 0$$

$$x - 4 = 0$$

$$x = 4$$

Question 2:

$$f'(x, y) = 9x^2 - 2y^2$$

and

$$f'(x, y) = 4 - 4xy$$

Question 3a:

No. The number of columns of the first matrix must equal the number of rows in the second matrix. In this case, $3! = 2$.

Question 3b:

$$\begin{bmatrix} -4 & 2 & -6 \\ -1 & -4 & 3 \\ 14 & 9 & 3 \end{bmatrix}$$
$$\begin{bmatrix} -4 & 2 & -6 \\ -1 + 1 & -4 + \frac{1}{2} & 3 + \frac{3}{2} \\ 14 - 14 & 9 + 7 & 3 - 21 \end{bmatrix}$$
$$\begin{bmatrix} -4 & 2 & -6 \\ 0 & -\frac{9}{2} & \frac{9}{2} \\ 0 & 16 & -18 \end{bmatrix}$$

Question 4:

Simple Gaussian: $f(x) = ae^{-\frac{(x-b)^2}{2c^2}}$

Multivariate Gaussian: $f(x, y) = A * \exp(-(\frac{(x-x_0)^2}{2\sigma_x^2} + \frac{(y-y_0)^2}{2\sigma_y^2}))$

Bernoulli: $P(n) = p^n(1-p)^{1-n}$

Binomial: $P_p(n|N) = \binom{N}{n} p^n q^{N-n}$

Exponential: $D(x) = 1 - e^{\lambda x}$

Question 6: 2 because WolframAlpha

Question 7a: $x = 1.1$ because you said so in class

Question 7b: Sorry, but I didn't get that one.

Question 8a:

Similar to how, in 6, if you have a random variable, the expected value would be, for $N(0, \infty)$, 0. So if we apply that the expected value of Y will be 0. Thus $P(Y = y) = e^{-0} = 1$.

Question 8b-d: Sorry, but it's not happening. MathLab was closed from Friday to Monday.