

**Quiz 0 (Ungraded)**

Aug 26, 2003

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

email: \_\_\_\_\_

1. **Department:** \_\_\_\_\_
2. **Field of Study/Advisor** (if any): \_\_\_\_\_
3. Are you taking this course for **credit** or **audit**?
4. Have you taken CS461 or 500? \_\_\_\_\_ CS530? \_\_\_\_\_
5. Give the expression for the pdf of a 1-dimensional Gaussian random variable  $x$  with mean  $\mu$  and variance  $\sigma$
6. Give the expression for the pdf of a N-dimensional Gaussian random variable  $X$  with mean vector  $\bar{X}$  and covariance matrix  $\Sigma$

7. Given the following continuous function of two variables:

$$f_{XY}(x, y) = \frac{1}{\tau\gamma} e^{-\frac{\tau x + \gamma y}{\tau\gamma}}$$

where both  $x$  and  $y$  range over  $[0, \infty)$ ,

- (a) Does this function represent a proper joint probability distribution over  $X$  and  $Y$ ? Why or why not?
  - (b) Find the marginal distributions of  $X$  and  $Y$ :
  - (c) Find the conditional distribution of  $X$  given that  $Y = 3$ :
8. **Define:**
    - (a) Degree of a graph:
    - (b) Branching factor of a tree:
    - (c) NP-Complete:
    - (d) Markov property:
    - (e) Eigenvalue: