

STAT 3332 Statistics for Life Sciences

Fall 2007

Quiz 3

Your Name (Please **PRINT**):

Your *Signature*:

1. Let random variable X have a continuous probability distribution with density function $f(x)$. Then $P(a \leq X \leq b) =$ (encircle best answer)

$f(a)f(b)$ $\int_a^b f(x)dx$ $\int_{-\infty}^{\infty} f(x)dx$ $f(a)+f(b)-2f(a)f(b)$ $f(b)/f(a)$

2. (Continuation) Suppose $f(3.4) = 0.46$. Then $P(X = 3.4) =$ (encircle best answer)

$f(3.4) = 0.46$ 0 $1 - f(3.4) = 0.54$ 3.4 none of these

3. Let random variable X have the Normal distribution with mean $\mu = 20$ and variance $\sigma^2 = 25$. Then $P(15 \leq X \leq 30) =$ (encircle best answer)

- (A) $P(-1 \leq N(0, 1) \leq +1)$
- (B) $P(-2 \leq N(0, 1) \leq +1)$
- (C) $P(-1 \leq N(0, 1) \leq +2)$
- (D) $P(-2 \leq N(0, 1) \leq +2)$
- (E) $P(0 \leq N(0, 1) \leq +\infty)$

4. (Continuation) For a random sample of size $n = 25$ from this population, the sample mean \bar{X} satisfies (encircle best answer)

- (A) $E(\bar{X}) = \frac{20}{25}$
- (B) $P(\bar{X} > 20) = 0$
- (C) $\text{Var}(\bar{X}) = 1$
- (D) each of (A), (B), (C)
- (E) none of (A), (B), (C)

5. (Continuation) For interval estimation of μ based on \bar{X} , the interval

$$\left(\bar{X} - 2\frac{\sigma}{\sqrt{n}}, \bar{X} + 2\frac{\sigma}{\sqrt{n}} \right)$$

has confidence approximately (encircle best answer)

50% 68% 95% 99%
