Hard Questions from Test Math Spring 2021

10 0 / 1 point

Let D be an exponential random variable with mean value 5. The value of $P[D > 17 \mid D > 8]$ is:

- ○ 0.67032
- ✕ ● 0.0301974

Correct Answer: **0.1652989**

- ○ 0.1652989
- ○ 0.5737534

Regrade 0 / 1 point

8 0 / 1 point

Let $Q(b)$ denote the right-tail probability of a standard Gaussian random variable. Suppose that X and Y are jointly-distributed Gaussian random variables with $X \sim N($ 3 , 18) and $Y \sim N($ 10 , 5). If the correlation coefficient between X and Y is 0.8, then $P[Y > 0 \mid X = 3] = Q(b)$, where b is:

- ○ -7.4535599
- ○ -4.4317226
- ✕ ● 2.6394515

Correct Answer: **-7.4535599**

- ○ -4.3138558

Regrade 0 / 1 point

12 0 / 1 point

Let X_i, $i = 1, \ldots 15$ denote a collection of mutually independent, identically distributed random variables with common mean 2 and variance 10. Let S be the sum of all the X_i's above. If $Q(x)$ is the right-tail probability of the standard Gaussian distribution,
then $P[S > 3] \approx Q(b)$, where b is

- ○ -6.2257864
- ✕ ◉ -6.6395281

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Correct Answer: **-2.2045408**

- ○ -12.8142321
- ○ -2.2045408

Regrade 0 / 1 point

16 0 / 1 point

U is a uniform random variable on $[0, 1]$, and $Y = cos\left(\frac{\pi}{2}U\right)$. The probability density function of Y at argument 0.7 is

- ✕ ◉ 1.061033

Correct Answer: **0.891446**

- ○ 0.891446
- ○ 0.6673589
- ○ 1.4605059

Regrade 0 / 1 point

7 0 / 1 point

Let $Q(b)$ denote the right-tail probability of a standard Gaussian random variable. Suppose that X and Y are jointly-distributed Gaussian random variables with $X \sim N(16, 6)$ and $Y \sim N(20, 13)$. If the correlation coefficient between X and Y is 0.3, then $P[Y > 0 \mid X = 3] = Q(b)$, where b is:

- ○ -4.1457921
- ○ -14.2293159
- ✕ ◉ -3.0521077

Correct Answer: **-4.1457921**

- ○ -1.7779721

Regrade 0 / 1 point

18 0 / 1 point

Given $P\,[A \cup B] = \ 0.6$ and $P[A \cup B^C] = \ 0.4333333$, where B^C represents the complement of B. The value of $P[A]$ is :

- 0.0166667
- 0.1333333
- × 0.1666667

Correct Answer: **0.0166667**

- 0.1

Regrade 0 / 1 point