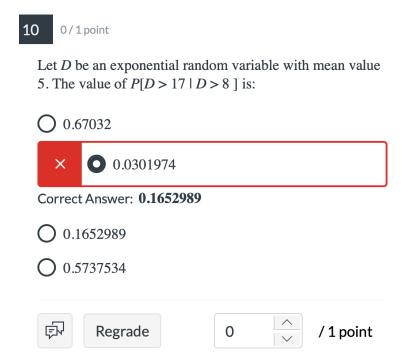
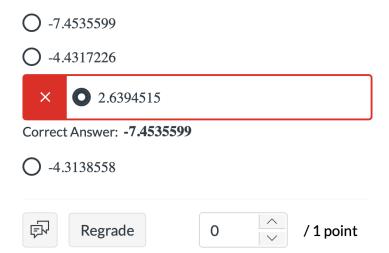
## Hard Questions from Test Math Spring 2021

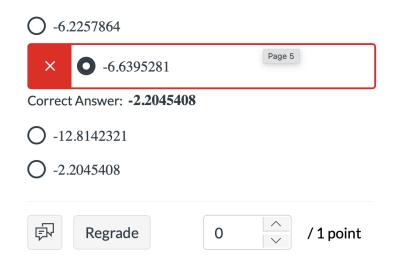


Let Q(b) denote the right-tail probability of a standard Gaussian random variable. Suppose that X and Y are jointly-distributed Gaussian random variables with  $X \sim N(3, 18)$  and  $Y \sim N(10, 5)$ . If the correlation coefficient between X and Y is 0.8, then  $P[Y > 0 \mid X = 3] = Q(b)$ , where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



## 12 0/1 point

Let  $X_i$ , i = 1, ... 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



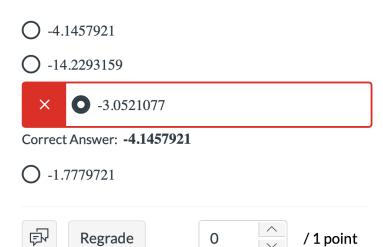
16 0/1 point

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



## 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:



Given  $P[A \cup B] = 0.6$  and  $P[A \cup B^C] = 0.43333333$ , where  $B^C$  represents the complement of B. The value of P[A] is :

0.0166667

0.1333333



Correct Answer: 0.0166667

0.1

Regrade 0 /1 point