

Note: Use 4 decimal places in your answers when rounding or using the normal table.

1. Using the pdf below, find the expected value of X.

X	Prob	
0	0.2	
1	0.4	
2	0.3	
3		

2. Find the standard deviation for the probability density function below, with $E[X] = 1.25$.

X	p		
-2	0.10		
-1	0.15		
0	0.15		
1	0.10		
3	0.50		

#3-4: A fair die is rolled 90 times. The random variable X is the number of times the die shows a “3”.

3. Find the expected value of X.
 4. Find the standard deviation of X.

Using the standard normal probability table, find:

5. $\Pr[-2.08 \leq Z \leq 1.93]$
 6. $\Pr[Z \leq -0.65]$
 7. $\Pr[Z \geq 1.29]$
 8. Suppose the length of an adult Manatee is normally distributed with mean 10 feet and standard deviation of 1.2 feet. If you encounter an adult Manatee, what is the probability that it will exceed 9 feet in length?
 9. Suppose that the weights of cyclists in a race were normally distributed with a mean of 174 pounds and a standard deviation of 12 pounds. Find the probability that a cyclist weighs between 170 and 180 pounds.

10. A jar contains 4 red marbles and 6 blue marbles. You reach in and randomly select two marbles. If X represents the number of blue marbles you selected, find the expected value of X . Hint: set-up the pdf in table form.

11. Assume that IQ scores are normally distributed with a mean of 100 and a standard deviation of 15.

[a] If people are identified for special education when their IQ score is in the lowest 1 percent of the population, what IQ score (to the nearest whole number) would a person need to receive special education?

[b] What IQ score (to the nearest whole number) does 35% of the population exceed?

#12-17 Let $A = \begin{bmatrix} -1 & -2 & 4 \\ 2 & 3 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 2 & -3 \\ -1 & 7 & 4 \end{bmatrix}$ $C = \begin{bmatrix} -2 & 4 \\ 3 & 2 \\ 5 & -1 \end{bmatrix}$ $D = \begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$

12. Find $A - B$.

13. Find $B + 2A$

14. Which of the products are defined? AB AC BC BA CA CB

15. If it is defined, find AC .

16. Find the element in the second row and first column of CA , if it is defined.

17. Find D^2

#18-21 Solve the following systems of equations:

18. $10x - 2y = -13$
 $-2x + 3y = 13$

20. $x + 6y + 3z = 4$
 $2x + y + 2z = 3$
 $3x - 2y + z = 0$

19. $x - 2y = -1$
 $-3x + 6y = 5$

21. $2x + 2y + z = 6$
 $4x - 3y + z = -8$
 $-2x - 6z = 5$

22. A company produces Italian sausages and bratwursts at plants in Green Bay and Sheboygan, WI. The Green Bay plant can produce 800 Italian sausages per hour and 800 bratwursts per hour. The Sheboygan plant can produce 500 Italian sausages per hour and 1000 bratwursts per hour. How many hours should each plant operate to fill an order of exactly 62,250 Italian sausages and 76,500 bratwursts?

Hint: Let $X = \#$ of hours the Green Bay plant operates and $Y = \#$ of hours the Sheboygan plant operates.