

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		

For questions 3 and 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.

For questions 10 and 11: Suppose a bowler throws a strike 70% of the time.

10. Find the probability that he throws a strike exactly 36 times in 48 attempts.

11. Now use the normal approximation to the binomial to find the probability that he will have between 30 and 40 strikes in 48 attempts, i.e. find $\Pr [30 \leq X \leq 40]$, where X is the number of strikes and is a binomial random variable.

12. 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.

Given the following set of data: 10, 11, 11, 12, 12, 14, 14, 14, 20

13. Find the median.

14. Find the mean.

15. Find the mode.

$$\text{Let } A = \begin{bmatrix} -1 & -2 & 4 \\ 2 & 3 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 2 & -3 \\ -1 & 7 & 4 \end{bmatrix} \quad C = \begin{bmatrix} -2 & 4 \\ 3 & 2 \\ 5 & -1 \end{bmatrix}$$

16. Find $A - B$.

17. Find $B + 2A$.

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

19. If it is defined, find AC .

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

$$\text{Let } D = \begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$$

21. Find D^{-1}

22. Find D^2

Solve the following systems of equations using the All-Integer or Gauss-Jordan method.

23. $10x - 2y = -13$
 $-2x + 3y = 13$

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

25. $2x + 2y + z = 6$
 $4x - 3y + z = -8$
 $-2x - 6z = 5$