

Solve the following LPP graphically :-

1. Maximize $z = 5x + 3y$
subject to :-
 $3x + 5y \leq 15$
 $5x + 27 \leq 10$
 $x, y > 0$
2. Minimize $z = 20x + 10y$, subject to $x + 2y \leq 40$, $3x + y > 30$, $4x + 3y > 60$ and $x, y \geq 0$.
3. Minimize and Maximize $z = 5x + 2y$ subject to $-2x - 3y \leq -6$, $x - 2y \leq 2$, $3x + 2y \leq 12$, $-3x + 2y \leq 3$, $x, y \geq 0$
4. Maximize and minimize $z = 3x + 5y$ subject to $3x - 4y + 12 \geq 0$, $2x - y + 2 \geq 0$, $2x + y + 2 \geq 0$, $0 \leq x \leq 4$, $y \geq 2$
5. Maximize $z = 4x + 3y$ subject to $3x + 4y \leq 24$, $8x + 6y \leq 48$, $x \leq 5$, $y \leq 6$, $x, y \geq 0$
6. Minimize $z = x - 5y + 20$ subject to $x - y \geq 0$, $-x + 2y \geq 2$, $x \geq 3$, $y \leq 4$, $x, y \geq 0$
7. Maximize $z = 15x + 10y$ subject to $3x + 2y \leq 80$, $2x + 3y \leq 70$, $x, y \geq 0$
8. Minimize $z = 2x + 4y$ subject to $x + y \geq 8$, $x + 4y \geq 12$, $x \geq 3$, $y \geq 2$
9. Maximize $z = 1x + 10y$ subject to $x + y \leq 30000$, $y \leq 12000$, $x \geq 6000$, $x > y$, $x, y \geq 0$
10. Minimize $z = 18x + 10y$ subject to $4x + y \geq 20$, $2x + 3y \leq 30$, $x, y \geq 0$

Probability

1. A family has two children. What is the prob. that both the children are boys given that at least one of them is a boy?
2. Ten cards numbered 1 through 10 are placed in a box, mixed up thoroughly and then one card is drawn randomly if it is known that the number in the drawn card is more than 3. What is the prob. That it is an even number /
3. Given that 2 nos. appearing on throwing two dice are different. Find the prob. Of the event the sum of nos. on the dice is 4.
4. A coin is tossed three times, of head occurs on first two tosses find the prob. Of getting on third toss..
5. A die is thrown 3 times, find the prob. that 4 appears on the third toss it is given that 6 & 5 appear resp. on first two tosses.
6. From a pack of 52 cards, 4 are drawn one by one without replacement, find the prob. That all are aces.
7. A bag contains 20 tickets numbered from 1 to 20. Two tickets are drawn without replacement. What is the prob. That first ticket has an even no. and the second an even no.
8. bag contains 5 white, 7 red & 3 black balls. If 3 balls are drawn one by one without replacement. Find prob. that none is red
9. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the prob. That both drawn balls are black?
10. A die is thrown twice the sum of the nos. appearing is observed to be 8. What is conditional prob. That the no. 5 has appeared at least one.
11. A pair of dice is thrown. Find the prob. of getting the sum 8 or more if 4 appears on the first die.
12. A problem in mathematics is given to 3 students whose chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$. What is the prob. That the problem is solved?
13. The odds against a solving certain problem are 4 to 3 and the odds in favour of B solving the same problem are 7 to 5. Find the prob. That the problem will be solved.
14. If A and B are two independent events $P(A \cup B) = 0.60$ and $P(A) = 0.2$ find $P(B)$.
15. A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six find prob. That it is actually a six.
16. Three urns contains 6 red, 4 black, 4 red, 6 black, and 6 red, 5 black, balls resp. one of the urns is selected at random and a ball is drawn from it. If the ball drawn is red, find the prob. That it is drawn from the first urn.
17. Three urns contain 6 red, 4 black, 4 red, 6 black, 5 red, 5 black balls resp. one of the urns is selected at random and a ball is drawn from it. If the ball drawn is red, find the prob. That it is drawn from the first urn.
18. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be hearts. Find the prob. of the missing card to be heart.
19. Suppose that 5% of men and 0.25% of women have grey hair. A grey haired person is selected at random. What is the prob. of this person being male / Assume that there are equal number of males and females.