

10. What is the conjugate of $1+\sqrt{-3}$?

- a) Write modulus of the complex number $1+\sqrt{-3}$?
- b) Write the polar form of the above.

11. Represent the complex numbers $2+i$ and $-3+4i$ by points on the complex plane, also plot their conjugates.

Solve the quadratic equation $(x+i)(x+3)+7=0$

12. Express the complex number

$\left(\frac{1}{1-4i} - \frac{2}{1+i}\right)\left(\frac{3-4i}{5+i}\right)$ in the form $a+ib$. Find a and b .

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Page 11 of 33

20. Prove that ${}^nC_r = {}^nC_{n-r}$

21. Find the value of n if ${}^nP_5 = 42 \cdot {}^nP_3$

22. Find n if ${}^nC_2 : {}^nC_1 = 3 : 2$

23. Find n if ${}^nP_4 = 18(n-1){}^nP_2$

24. Find r if ${}^{15}C_r : {}^{15}C_{r-1} = 11 : 5$

25. Find n if ${}^nC_3 : {}^nC_2 = 12 : 1$

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Page 15 of 33

23. The sum of two numbers is 6 times their GM show that numbers are in the ratio $3+2\sqrt{2} : 3-2\sqrt{2}$
24. $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is the A.M of a and b. what is the value of n?
25. The first term of a GP is 1. The sum of the third and the fifth term is 90. Find its common ratio.
26. Evaluate $2^2+4^2+6^2+\dots+(2n)^2$
27. In an AP the first term is 2 and the sum of the first five terms is one fourth the sum of the next five terms
- Find the common difference.
 - Find the 20th term.
28. If AM and GM of two numbers are 10 and 8 respectively. Find the numbers.
29. In an AP if mth term is 'n' and nth term is m. Find the (m+n)th term.
30. The first term of an A.P is 11 & its 8th term is 81. What is the common difference?
31. The sum of the first 3 terms of G.P. is 16 & the sum of the next three terms is 128. Then determine
- Its first term
 - Common ratio
 - Sum to n terms
32. The sum of first three term of a G.P is $\frac{13}{12}$ and their product is -1. Find the common ratio and the terms
33. Find the 10th term of a G.P whose 3rd term is 24 and 6th term is 192.

11. Write the contrapositive of the statement

P: if the physical environment changes then the biological environment changes.

12. Write the negation of the following statement

“Delhi is in India and Moscow is in Russia”

13. Write the converse of the statement

“P: If a divides b then b is a multiple of a”

Ans. If b is a multiple of a, then a divides b.

14. Consider the compound statement

P: $2+2$ is equal to 4 or 6

a) Write the component statements

b) Is the compound statement true? Why?

Ans. a) $2+2$ is equal to 4, $2+2$ is equal to 6

b) True. Here connecting word is or.

15. Write the negation of the statement.

“Both the diagonals of a rectangle have the same length”

Ans. it is false that both the diagonals of a rectangle have the same length.

16. Write the converse of the statement

If a number n is even, then n^2 is even

Ans. if n^2 is even then n is even.

- a) Find $P(A \text{ or } B)$ b) $P(\text{not } A \text{ and not } B)$
13. If $P(A)=0.4$, $P(B)=0.3$, then find $P(A \cup B)'$. (Given that A and B are mutually exclusive).
14. Two students A and B appeared in an examination. The probability that A passes the exam 0.25 and B passes is 0.45. Also the probability that both will pass is 0.1. Find the probability that
- a) Both will not pass b) Only one of them will pass
15. A coin is tossed three times. Consider the following events
- A: No head appears.
 B: Exactly one head appears.
 C: At least two heads appear.
16. A committee of 3 persons is selected from 3 men and 4 women. What is the probability that the committee will have two women?
17. Three coins are tossed once. Find the probability of getting
- a) No head. b) Exactly 1 head. c) At least 1 head. d) At least 2 heads.
18. Two students Anil and Ashima appeared in an examination. The probability that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. the probability that both will qualify the examination is 0.02. find the probability that
- a) Both Anil and Ashima will not qualify the examination.
 b) At least one of them will not qualify the examination.
19. A bag contains 4 red and 3 green balls. 2 balls are drawn at random. Find the probability of getting exactly 1 red.
20. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find
- a) The probability that the student opted for NCC and NSS.
 b) The probability that the student has opted for exactly one of NCC and NSS.
21. A card is drawn from a well shuffled deck of 52 cards. Find the probability that
- a) It is either a heart or a queen. b) It is neither red nor ace.
22. A bag contains 3 white, 4 black & 2 yellow balls. Two balls are drawn at random.
- a) Find the probability that the 2 balls drawn are of the same colour.
 b) Find the probability that none of the balls drawn are yellow in colour.