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CLASS 11

Mathematics

Sample Paper 4 - Questions

38 questions | 80 marks | 2026-27

Time: 3 hours. Answer all questions and subparts unless a choice is stated. Marks are shown on the right. Write answers on separate sheets. Independently prepared practice paper.

Section A - Objective questions

1. How many two-member committees can be chosen from 31 distinct people? **1**
(A) 465 (B) 466 (C) 467 (D) 464

2. In a group, n(A) = 52, n(B) = 50 and n(A intersection B) = 37. Calculate n(A union B). **1**
(A) 67 (B) 65 (C) 64 (D) 66

3. Determine the value of lim as x tends to 28 of $(x^2 - 784)/(x - 28)$. **1**
(A) 58 (B) 56 (C) 55 (D) 57

4. Calculate the greatest integer satisfying $2x + 29 <= 47$. **1**
(A) 10 (B) 8 (C) 9 (D) 11

5. A GP has first term 30 and common ratio 2. Calculate term number 5. **1**
(A) 480 (B) 482 (C) 481 (D) 479

6. How many ordered arrangements of 3 distinct objects can be selected from 36 distinct objects? **1**
(A) 42840 (B) 42841 (C) 42842 (D) 42839

7. Calculate the coefficient of x^2 in $(1 + x)^{32}$. **1**
(A) 498 (B) 496 (C) 497 (D) 495

8. Calculate the distance between (0,0,0) and (56,84,168). **1**
(A) 195 (B) 197 (C) 196 (D) 198

9. Calculate the slope of the line through (26, 28) and (29, 34). **1**
(A) 1 (B) 3 (C) 4 (D) 2

10. For the parabola $y^2 = 112x$, find the distance of its focus from the origin. **1**
(A) 29 (B) 28 (C) 27 (D) 30

11. Calculate the real part of (29 + 2i)(2 - i). **1**
(A) 60 (B) 61 (C) 59 (D) 62

12. Calculate the population variance of 30, 32, 34. **1**
(A) 8/3 (B) 11/3 (C) 5/3 (D) 14/3

13. For $f(x) = 29x^2$, find f'(3). **1**
(A) 173 (B) 175 (C) 176 (D) 174

14. A fair die is rolled. Calculate the probability of obtaining an even number. **1**
(A) -1/2 (B) 5/2 (C) 1/2 (D) 3/2

15. Calculate the sum of the first 41 terms of the AP beginning 35, 37, 39. **1**
(A) 3077 (B) 3074 (C) 3075 (D) 3076

16. How many two-member committees can be chosen from 34 distinct people? **1**
(A) 561 (B) 560 (C) 562 (D) 563

17. A GP has first term 34 and common ratio 2. Calculate term number 6. **1**
(A) 1088 (B) 1090 (C) 1087 (D) 1089

18. In a group, n(A) = 49, n(B) = 47 and n(A intersection B) = 34. Calculate n(A union B). **1**
(A) 63 (B) 61 (C) 64 (D) 62

19. Calculate the real part of (30 + 2i)(2 - i). **1**
(A) 64 (B) 63 (C) 61 (D) 62

20. Calculate the population variance of 29, 31, 33. **1**
(A) 5/3 (B) 14/3 (C) 11/3 (D) 8/3

Section B - Short responses

21. Calculate the distance between (0,0,0) and (60,90,180). **2**

22. Calculate the slope of the line through (29, 31) and (32, 37). **2**

23. How many ordered arrangements of 3 distinct objects can be selected from 34 distinct objects? **2**

24. Determine the value of lim as x tends to 26 of $(x^2 - 676)/(x - 26)$. **2**

25. Calculate the greatest integer satisfying $2x + 27 <= 45$. **2**

Section C - Short responses

26. For the parabola $y^2 = 136x$, find the distance of its focus from the origin. State its directrix and the length of its latus rectum. **3**

27. Calculate the coefficient of x^2 in $(1 + x)^{37}$. Show the governing rule, substitution and conclusion clearly. **3**

28. An AP has first term 34 and common difference 4. Calculate its 40th term. Show the governing rule, substitution and conclusion clearly. **3**

29. Use first principles to differentiate $f(x)=32x^2$. Then calculate f'(3), explaining the limiting step. **3**

30. How many two-member committees can be chosen from 32 distinct people? How would the count change if the two roles were president and secretary? Explain. **3**

31. For the observations 33,35,37, calculate the mean, population variance and population standard deviation. Show the squared deviations. **3**

Section D - Extended responses

32. For the GP 3, 6, 12, ..., identify a and r, find the 8th term, and calculate the sum of the first 8 terms. **5**

33. Prove from the binomial theorem that the sum of the coefficients of (1 + x)^n is 2^n for a nonnegative integer n. **5**

34. If sin theta = 3/5 and theta lies in quadrant II, find cos theta, tan theta, sin 2theta and cos 2theta, showing the sign reasoning. **5**

35. Using first principles, find the derivative of x^2 and explain the limiting step. **5**

Section E - Case and application questions

36. A hall has 11 seats in its first row, with 2 more in each successive row. There are 16 rows.

(a) State the common difference. **1**

(b) Find the final row's seating. **1**

(c) Calculate the total seats. **2**

37. A circle has centre (6,−2) and radius 7.

(a) State the standard equation. **1**

(b) Find its intersections with y=−2. **1**

(c) Test whether (6, 5) lies on it, showing substitution. **2**

38. A bag holds 8 red and 9 blue counters. One is drawn at random.

(a) State the total number. **1**

(b) Find the probability of red. **1**

(c) Find the probability of not red and explain your method. **2**

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