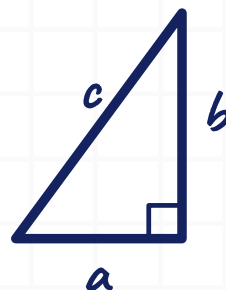
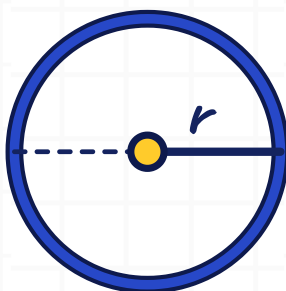


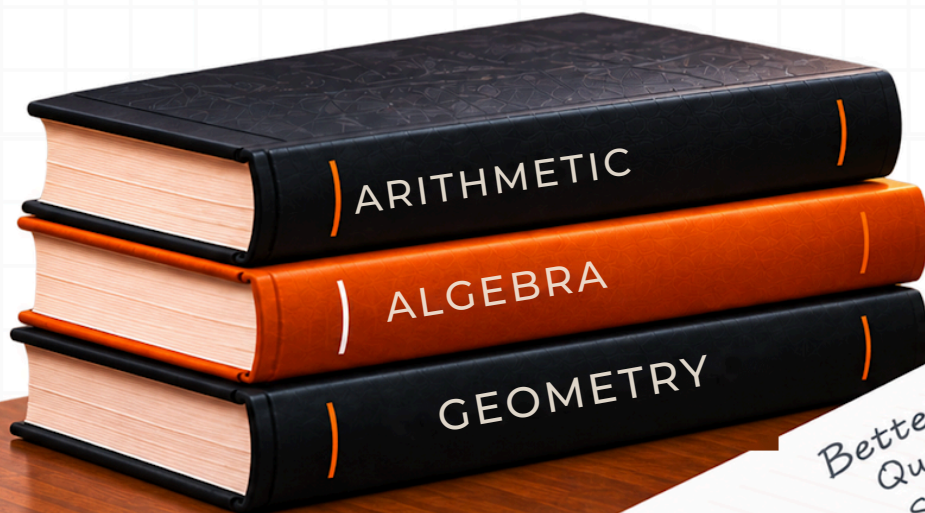
CAT PYQ

Linear Equations

$$a^2 + b^2 = c^2$$



$$D = S \times T$$



Better
Questions
Stronger
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Brighter Future

Linear Equations CAT PYQ



Common Admission Test - Indian Institutes of Management

53 Questions

Quantitative Aptitude

Years: 1990-2025

General Instructions

- (i) This collection contains **53 Quantitative Aptitude questions** classified under **Linear Equations**, following the supplied CD PYQ sheet.
- (ii) **Coverage:** CAT 1990-2025. Questions are grouped by their source year and sitting, with continuous numbering from **1 to 53**.
- (iii) This collection has **51 multiple choice questions (MCQs)** and **2 Type In The Answer (TITA) questions**. Read every option before choosing the answer. Enter a response for questions marked "Type in the answer."
- (iv) Original mathematical expressions, question wording and option order are retained. Use the diagrams and data provided with each question.
- (v) Each question carries its original year or exam date, sitting where available, and source question number. References distinguish the two CAT 2003 sittings.
- (vi) Use this collection for practice. Follow the timing and marking scheme of the original sitting when attempting a timed exercise.
- (vii) Answer keys and solutions are not included. Passages and questions may continue onto the following page.

CAT 2025 Slot 1 - Questions 1-2

1. Stocks A, B and C are priced at rupees 120, 90 and 150 per share, respectively. A trader holds a portfolio consisting of 10 shares of stock A, and 20 shares of stocks B and C put together. If the total value of her portfolio is rupees 3300, then the number of shares of stock B that she holds, is

30 Nov 2025, Slot 1, Q51

Type in the answer.

2. If $a - 6b + 6c = 4$ and $6a + 3b - 3c = 50$, where a, b and c are real numbers, the value of $2a + 3b - 3c$ is

30 Nov 2025, Slot 1, Q62

(A) 20

(B) 14

(C) 18

(D) 15

CAT 2025 Slot 3 - Questions 3-3

3. In a school with 1500 students, each student chooses any one of the streams out of science, arts, and commerce, by paying a fee of Rs 1100, Rs 1000, and Rs 800, respectively. The total fee paid by all the students is Rs 15,50,000. If the number of science students is not more than the number of arts students, then the maximum possible number of science students in the school is

30 Nov 2025, Slot 3, Q49

Type in the answer.

CAT 2024 Slot 1 - Questions 4-4

4. A shop wants to sell a certain quantity (in kg) of grains. It sells half the quantity and an additional 3 kg of these grains to the first customer. Then, it sells half of the remaining quantity and an additional 3 kg of these grains to the second customer. Finally, when the shop sells half of the remaining quantity and an additional 3 kg of these grains to the third customer, there are no grains left. The initial quantity, in kg, of grains is

24 Nov 2024, Slot 1, Q66

(A) 50

(B) 36

(C) 42

(D) 18

CAT 2024 Slot 2 - Questions 5-5

5. If x and y satisfy the equations $|x| + x + y = 15$ and $x + |y| - y = 20$, then $(x - y)$ equals

24 Nov 2024, Slot 2, Q66

(A) 20

(B) 15

(C) 5

(D) 10

CAT 2024 Slot 3 - Questions 6-6

6. For some constant real numbers p , k and a , consider the following system of linear equations in x and y : $px - 4y = 2$ $3x + ky = a$ A necessary condition for the system to have no solution for (x, y) , is

24 Nov 2024, Slot 3, Q64

(A) $ap + 6 = 0$

(B) $2a + k \neq 0$

(C) $ap - 6 = 0$

(D) $kp + 12 \neq 0$

CAT 2023 Slot 3 - Questions 7-7

7. For some real numbers a and b , the system of equations $x + y = 4$ and $(a + 5)x + (b^2 - 15)y = 8b$ has infinitely many solutions for x and y . Then, the maximum possible value of ab is

26 Nov 2023, Slot 3, Q47

(A) 33

(B) 25

(C) 15

(D) 55

CAT 2021 Slot 1 - Questions 8-8

8. A basket of 2 apples, 4 oranges and 6 mangoes costs the same as a basket of 1 apple, 4 oranges and 8 mangoes, or a basket of 8 oranges and 7 mangoes. Then the number of mangoes in a basket of mangoes that has the same cost as the other baskets is

28 Nov 2021, Slot 1, Q53

(A) 11

(B) 13

(C) 10

(D) 12

CAT 2021 Slot 3 - Questions 9-11

9. A shop owner bought a total of 64 shirts from a wholesale market that came in two sizes, small and large. The price of a small shirt was INR 50 less than that of a large shirt. She paid a total of INR 5000 for the large shirts, and a total of INR 1800 for the small shirts. Then, the price of a large shirt and a small shirt together, in INR, is

28 Nov 2021, Slot 3, Q45

- (A) 175 (B) 150
(C) 200 (D) 225

10. One part of a hostel's monthly expenses is fixed, and the other part is proportional to the number of its boarders. The hostel collects ₹ 1600 per month from each boarder. When the number of boarders is 50, the profit of the hostel is ₹ 200 per boarder, and when the number of boarders is 75, the profit of the hostel is ₹ 250 per boarder. When the number of boarders is 80, the total profit of the hostel, in INR, will be

28 Nov 2021, Slot 3, Q53

- (A) 20200 (B) 20500
(C) 20800 (D) 20000

11. If $3x + 2|y| + y = 7$ and $x + |x| + 3y = 1$ then $x + 2y$ is:

28 Nov 2021, Slot 3, Q66

- (A) $-\frac{4}{3}$ (B) $\frac{8}{3}$
(C) 0 (D) 1

CAT 2020 Slot 1 - Questions 12-12

12. Let A, B and C be three positive integers such that the sum of A and the mean of B and C is 5. In addition, the sum of B and the mean of A and C is 7. Then the sum of A and B is

29 Nov 2020, Slot 1, Q76

- | | |
|-------|-------|
| (A) 5 | (B) 4 |
| (C) 6 | (D) 7 |
-

CAT 2020 Slot 2 - Questions 13-13

13. Aron bought some pencils and sharpeners. Spending the same amount of money as Aron, Aditya bought twice as many pencils and 10 less sharpeners. If the cost of one sharpener is ₹ 2 more than the cost of a pencil, then the minimum possible number of pencils bought by Aron and Aditya together is

29 Nov 2020, Slot 2, Q73

(A) 33

(B) 27

(C) 30

(D) 36

14. Let k be a constant. The equations $kx + y = 3$ and $4x + ky = 4$ have a unique solution if and only if

29 Nov 2020, Slot 3, Q68

(A) $|k| \neq 2$

(B) $|k| = 2$

(C) $k \neq 2$

(D) $k = 2$

CAT 2019 Slot 2 - Questions 15-15

15. In 2010, a library contained a total of 11500 books in two categories - fiction and nonfiction. In 2015, the library contained a total of 12760 books in these two categories. During this period, there was 10% increase in the fiction category while there was 12% increase in the non-fiction category. How many fiction books were in the library in 2015?

24 Nov 2019, Slot 2, Q87

- | | |
|----------|----------|
| (A) 6160 | (B) 6600 |
| (C) 6000 | (D) 5500 |
-

CAT 2018 Slot 2 - Questions 16-16

16. The scores of Amal and Bimal in an examination are in the ratio 11 : 14. After an appeal, their scores increase by the same amount and their new scores are in the ratio 47 : 56. The ratio of Bimal's new score to that of his original score is

25 Nov 2018, Slot 2, Q71

(A) 4 : 3

(B) 8 : 5

(C) 5 : 4

(D) 3 : 2

17. A shop stores x kg of rice. The first customer buys half this amount plus half a kg of rice. The second customer buys half the remaining amount plus half a kg of rice. Then the third customer also buys half the remaining amount plus half a kg of rice. Thereafter, no rice is left in the shop. Which of the following best describes the value of x ?

16 Nov 2008, Q4

- (A) $2 \leq x \leq 6$ (B) $5 \leq x \leq 8$
(C) $9 \leq x \leq 12$ (D) $11 \leq x \leq 14$
(E) $13 \leq x \leq 18$
-

CAT 2007 - Questions 18-19

18. A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount?

18 Nov 2007, Q5

- (A) Over Rupees 13 but less than Rupees 14 (B) Over Rupees 7 but less than Rupees 8
(C) Over Rupees 22 but less than Rupees 23 (D) Over Rupees 18 but less than Rupees 19
(E) Over Rupees 4 but less than Rupees 5

19. The price of Darjeeling tea (in rupees per kilogram) is $100 + 0.10n$, on the n th day of 2007 ($n=1, 2, \dots, 100$), and then remains constant. On the other hand, the price of Ooty tea (in rupees per kilogram) is $89 + 0.15n$, on the n th day of 2007 ($n = 1, 2, \dots, 365$). On which date in 2007 will the prices of these two varieties of tea be equal?

18 Nov 2007, Q21

- (A) May 21 (B) April 11
(C) May 20 (D) April 10
(E) June 30

20. The number of solutions of the equation $2x + y = 40$ where both x and y are positive integers and $x \leq y$ is:

19 Nov 2006, Q67

- | | |
|--------|--------|
| (A) 7 | (B) 13 |
| (C) 14 | (D) 18 |
| (E) 20 | |
-

21. A telecom service provider engages male and female operators for answering 1000 calls per day. A male operator can handle 40 calls per day whereas a female operator can handle 50 calls per day. The male and the female operators get a fixed wage of Rs. 250 and Rs. 300 per day respectively. In addition, a male operator gets Rs. 15 per call he answers and a female operator gets Rs. 10 per call she answers. To minimize the total cost, how many male operators should the service provider employ assuming he has to employ more than 7 of the 12 female operators available for the job?

20 Nov 2005, Q28

- | | |
|--------|--------|
| (A) 15 | (B) 14 |
| (C) 12 | (D) 10 |
-

22. If $\frac{a}{b+c} = \frac{b}{a+c} = \frac{c}{b+a} = r$, then r cannot take any value except

21 Nov 2004, Q47

(A) $1/2$

(B) -1

(C) $1/2$ or -1

(D) $-1/2$ or -1

23. If x and y are integers, then the equation $5x + 19y = 64$ has

15 Feb 2004, CAT 2003 Re-test, Q74

(A) no solution for $x < 300$ and $y < 0$

(B) no solution for $x > 250$ and $y > -100$

(C) a solution for $250 < x < 300$

(D) a solution for $-59 < y < -56$

24. Which one of the following conditions must p , q and r satisfy so that the following system of linear simultaneous equations has at least one solution, such that $p + q + r \neq 0$? $x + 2y - 3z = p$ $2x + 6y - 11z = q$ $x - 2y + 7z = r$

23 Nov 2003, CAT 2003 Original sitting, Q108

(A) $5p - 2q - r = 0$

(B) $5p + 2q + r = 0$

(C) $5p + 2q - r = 0$

(D) $5p - 2q + r = 0$

CAT 2002 - Questions 25-29

25. The owner of a local jewellery store hired three watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave $\frac{1}{2}$ of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

CAT 2002, Q66

- (A) 40 (B) 36
(C) 25 (D) None of these

26. Mayank, Mirza, Little and Jaspal bought a motorbike for \$60. Mayank paid one-half of the sum of the amounts paid by the other boys. Mirza paid one-third of the sum of the amounts paid by the other boys. Little paid one-fourth of the sum of the amounts paid by the other boys. How much did Jaspal have to pay?

CAT 2002, Q67

- (A) \$15 (B) \$13
(C) \$17 (D) None of these

27. A rich merchant had collected many gold coins. He did not want anybody to know about him. One day, his wife asked, "How many gold coins do we have?" After a brief pause, he replied, "Well! if I divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the squares of the two numbers." The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has?

CAT 2002, Q68

- (A) 96 (B) 53
(C) 43 (D) None of these

28. Shyam visited Ram during his brief vacation. In the mornings they both would go for yoga. In the evenings they would play tennis. To have more fun, they indulge only in one activity per day, i.e. either they went for yoga or played tennis each day. There were days when they were lazy and stayed home all day long. There were 24 mornings when they did nothing, 14 evenings when they stayed at home, and a total of 22 days when they did yoga or played tennis. For how many days Shyam stayed with Ram?

CAT 2002, Q69

- (A) 32 (B) 24
(C) 30 (D) None of these

29. A piece of string is 40 cm long. It is cut into three pieces. The longest piece is three times as long as the middle-sized and the shortest piece is 23 cm shorter than the longest piece. Find the length of the shortest piece.

CAT 2002, Q88

- (A) 27 (B) 5
(C) 4 (D) 9

CAT 2001 - Questions 30-34

30. Anita had to do a multiplication. In stead of taking 35 as one of the multipliers, she took 53. As a result, the product went up by 540. What is the new product?

CAT 2001, Q12

- (A) 1050 (B) 540
(C) 1440 (D) 1590

31. Every 10 years the Indian Government counts all the people living in the country. Suppose that the director of the census has reported the following data on two neighbouring villages Chota Hazri and Mota Hazri. Chota Hazri has 4,522 fewer males than Mota Hazri. Mota Hazri has 4,020 more females than males. Chota Hazri has twice as many females as males. Chota Hazri has 2,910 fewer females than Mota Hazri. What is the total number of males in Chota Hazri?

CAT 2001, Q21

- (A) 11,264 (B) 14,174
(C) 5,632 (D) 10,154

32. At a certain fast food restaurant, Brian can buy 3 burgers, 7 shakes, and one order of fries for Rs. 120 exactly. At the same place it would cost Rs. 164.5 for 4 burgers, 10 shakes, and one order of fries. How much would it cost for an ordinary meal of one burger, one shake, and one order of fries?

CAT 2001, Q26

- (A) Rs. 31 (B) Rs. 41
(C) Rs. 21 (D) Cannot be determined

33. In some code, letters a, b, c, d and e represent numbers 2, 4, 5, 6 and 10. We just do not know which letter represents which number. Consider the following relationships: I. $a + c = e$, II. $b - d = d$ and III. $e + a = b$ Which of the following statements is true?

CAT 2001, Q44

- (A) $b = 4, d = 2$ (B) $a = 4, e = 6$
(C) $b = 6, e = 2$ (D) $a = 4, c = 6$

34. A change-making machine contains one-rupee, two-rupee and five-rupee coins. The total number of coins is 300. The amount is Rs. 960. If the numbers of one-rupee coins and two-rupee coins are inter-changed, the value comes down by Rs. 40. The total number of five-rupee coins is

CAT 2001, Q46

- (A) 100 (B) 140
(C) 60 (D) 150

CAT 2000 - Questions 35-38

35. If $x^2 + y^2 = 0.1$ and $|x-y| = 0.2$, then $|x| + |y|$ is equal to:

CAT 2000, Q95

- (A) 0.3 (B) 0.4
(C) 0.2 (D) 0.6
-

36. A shipping clerk has five boxes of different but unknown weights each weighing less than 100 kgs. The clerk weighs the boxes in pairs. The weights obtained are 110, 112, 113, 114, 115, 116, 117, 118, 120 and 121 kgs. What is the weight, in kgs, of the heaviest box?

CAT 2000, Q103

- (A) 60 (B) 62
(C) 64 (D) cannot be determined
-

37. Two full tanks, one shaped like a cylinder and the other like a cone, contain jet fuel. The cylindrical tank holds 500 litres more than the conical tank. After 200 litres of fuel has been pumped out from each tank the cylindrical tank contains twice the amount of fuel in the conical tank. How many litres of fuel did the cylindrical tank have when it was full?

CAT 2000, Q109

- (A) 700 (B) 1000
(C) 1100 (D) 1200
-

38. A farmer has decided to build a wire fence along one straight side of this property. For this, he planned to place several fence-posts at six metre intervals, with posts fixed at both ends of the side. After he bought the posts and wire, he found that the number of posts he had bought was five less than required. However, he discovered that the number of posts he had bought would be just sufficient if he spaced them eight metres apart. What is the length of the side of his property and how many posts did he buy?

CAT 2000, Q110

- (A) 100 metres, 15 (B) 100 metres, 16
(C) 120 metres, 15 (D) 120 metres, 16
-

CAT 1999 - Questions 39-41

39. The number of positive integer valued pairs (x, y) , satisfying $4x - 17y = 1$ and $x < 1000$ is:

CAT 1999, Q56

- (A) 59
(B) 57
(C) 55
(D) 58
-

40. Total expenses of a boarding house are partly fixed and partly varying linearly with the number of boarders. The average expense per boarder is Rs. 700 when there are 25 boarders and Rs. 600 when there are 50 boarders. What is the average expense per boarder when there are 100 boarders?

CAT 1999, Q62

- (A) 550
(B) 580
(C) 540
(D) 560
-

41. If $|r - 6| = 11$ and $|2q - 12| = 8$, what is the minimum possible value of q/r ?

CAT 1999, Q64

- (A) $-2/5$
(B) $2/17$
(C) $10/17$
(D) None of these
-

CAT 1998 - Questions 42-42

42. A yearly payment to the servant is Rs. 90 plus one turban. The servant leaves the job after 9 months and receives Rs. 65 and a turban. Then find the price of the turban.

CAT 1998, Q70

- (A) Rs. 10
(B) Rs. 15
(C) Rs. 7.50
(D) Cannot be determined
-

CAT 1997 - Questions 43-45

43. A student instead of finding the value of $\frac{7}{8}$ of a number, found the value of $\frac{7}{18}$ of the number. If his answer differed from the actual one by 770, find the number.

CAT 1997, Q115

- | | |
|----------|----------|
| (A) 1584 | (B) 2520 |
| (C) 1728 | (D) 1656 |

44. A man earns $x\%$ on the first Rs. 2,000 and $y\%$ on the rest of his income. If he earns Rs. 700 from income of Rs. 4,000 and Rs. 900 from Rs. 5,000 of income, find $x\%$.

CAT 1997, Q125

- | | |
|---------|-------------------|
| (A) 20% | (B) 15% |
| (C) 25% | (D) None of these |

45. P, Q and R are three consecutive odd numbers in ascending order. If the value of three times P is 3 less than two times R, find the value of R.

CAT 1997, Q127

- | | |
|-------|--------|
| (A) 5 | (B) 7 |
| (C) 9 | (D) 11 |

CAT 1996 - Questions 46-47

46. Once I had been to the post office to buy five-rupee, two-rupee and one-rupee stamps. I paid the clerk Rs. 20, and since he had no change, he gave me three more one-rupee stamps. If the number of stamps of each type that I had ordered initially was more than one, what was the total number of stamps that I had when I left the post office?

CAT 1996, Q122

- (A) 10 (B) 9
(C) 12 (D) 8
-

47. I bought 5 pens, 7 pencils and 4 erasers. Rajan bought 6 pens, 8 erasers and 14 pencils for an amount which was half more what I had paid. What per cent of the total amount paid by me was paid for the pens?

CAT 1996, Q130

- (A) 37.5% (B) 62.5%
(C) 50% (D) None of these
-

CAT 1991 - Questions 48-51

48. What is the value of k for which the following system of equations has no solution: $2x - 8y = 3$ and $kx + 4y = 10$

CAT 1991, Q62

- | | |
|--------|-------|
| (A) -2 | (B) 1 |
| (C) -1 | (D) 2 |

49. Iqbal dealt some cards to Mushtaq and himself from a full pack of playing cards and laid the rest aside. Iqbal then said to Mushtaq. "If you give me a certain number of your cards, I will have four times as many cards as you will have. If I give you the same number of cards, I will have thrice as many cards as you will have". Of the given choices, which could represent the number of cards with Iqbal?

CAT 1991, Q65

- | | |
|--------|--------|
| (A) 9 | (B) 31 |
| (C) 12 | (D) 35 |

50. Three times the first of three consecutive odd integers is 3 more than twice the third. What is the third integer?

CAT 1991, Q67

- | | |
|--------|-------|
| (A) 15 | (B) 9 |
| (C) 11 | (D) 5 |

51. In Sivakasi, each boy's quota of match sticks to fill into boxes is not more than 200 per session. If he reduces the number of sticks per box by 25, he can fill 3 more boxes with the total number of sticks assigned to him. Which of the following is the possible number of sticks assigned to each boy?

CAT 1991, Q91

- | | |
|---------|---------|
| (A) 200 | (B) 150 |
| (C) 125 | (D) 175 |

CAT 1990 - Questions 52-53

52. I brought 30 books on Mathematics, Physics, and Chemistry, priced at Rs.17, Rs.19, and Rs.23 per book respectively, for distribution among poor students of Standard X of a school. The physics books were more in number than the Mathematics books but less than the Chemistry books, the difference being more than one. The total cost amounted to Rs.620. How many books on Mathematics, Physics, and Chemistry could have been bought respectively?

CAT 1990, Q49

- (A) 5, 8, 17
(B) 5, 12, 13
(C) 5, 10, 15
(D) 5, 6, 19

53. The last time Rahul bought Diwali cards, he found that the four types of cards that he liked were priced Rs.2.00, Rs.3.50, Rs.4.50 and Rs.5.00 each. As Rahul wanted 30 cards, he took five each of two kinds and ten each of the other two, putting down the exact number of 10 rupees notes on the counter payment. How many notes did Rahul give?

CAT 1990, Q50

- (A) 8
(B) 9
(C) 10
(D) 11

- End of PYQ Collection -