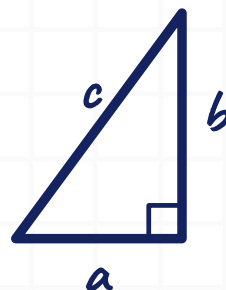
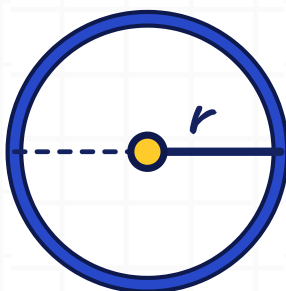


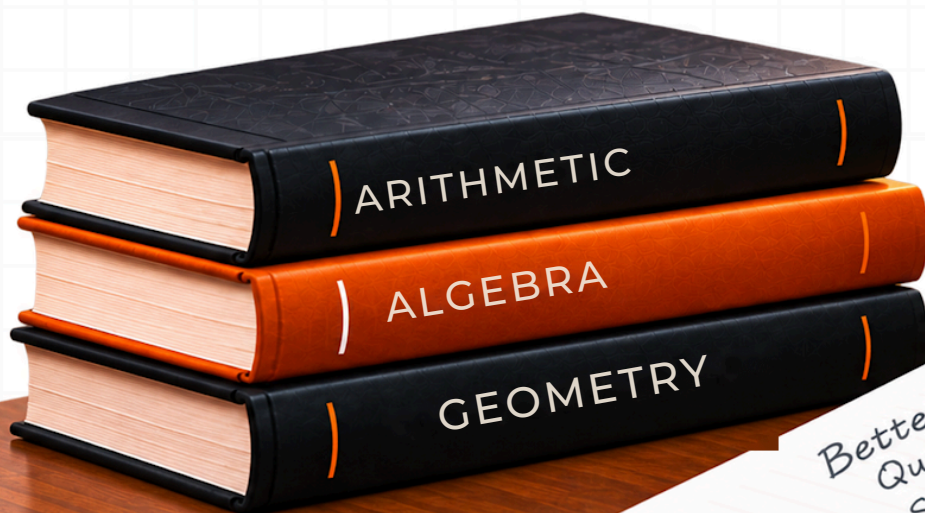
CAT PYQ

Functions & Graphs

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



$$D = S \times T$$



Better
Questions
Stronger
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Brighter Future

Functions & Graphs CAT PYQ



Common Admission Test - Indian Institutes of Management

70 Questions

Quantitative Aptitude

Years: 1990-2025

General Instructions

- (i) This collection contains **70 Quantitative Aptitude questions** classified under **Functions & Graphs**, 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 70**.
- (iii) This collection has **60 multiple choice questions (MCQs)** and **10 Type In The Answer (TITA) questions**. Read every option before choosing the answer. Enter a response for questions marked "Type in the answer."
- (iv) All required shared passages and data sets for the selected questions are included. Blue range labels refer to the question numbers **in this collection**. Read the full passage, chart, table or conditions before answering.
- (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 1-1

1. Let $3 \leq x \leq 6$ and $[x^2] = [x]^2$, where $[x]$ is the greatest integer not exceeding x . If set S represents all feasible values of x , then a possible subset of S is

30 Nov 2025, Slot 1, Q50

(A) $(3, \sqrt{10}) \cup [5, \sqrt{26}) \cup \{6\}$

(B) $[3, \sqrt{10}] \cup [5, \sqrt{26}]$

(C) $[3, \sqrt{10}] \cup [4, \sqrt{17}] \cup \{6\}$

(D) $(4, \sqrt{18}) \cup [5, \sqrt{27}) \cup \{6\}$

CAT 2025 Slot 2 - Questions 2-2

2. Let $f(x) = \frac{x}{(2x-1)}$ and $g(x) = \frac{x}{(x-1)}$. Then the domain of the function $h(x) = f(g(x)) + g(f(x))$ is all real numbers except

30 Nov 2025, Slot 2, Q57

- (A) $-1, \frac{1}{2},$ and 1
(C) $-\frac{1}{2}, \frac{1}{2},$ and 1

- (B) $\frac{1}{2}, 1,$ and $\frac{3}{2}$
(D) $\frac{1}{2},$ and 1
-

CAT 2025 Slot 3 - Questions 3-3

3. For real values of x , the range of the function $f(x) = \frac{2x - 3}{2x^2 + 4x - 6}$ is

30 Nov 2025, Slot 3, Q56

(A) $\left(-\infty, \frac{1}{8}\right] \cup [1, \infty)$

(B) $\left(-\infty, \frac{1}{4}\right] \cup [1, \infty)$

(C) $\left(-\infty, \frac{1}{8}\right] \cup \left[\frac{1}{2}, \infty\right)$

(D) $\left(-\infty, \frac{1}{4}\right] \cup \left[\frac{1}{2}, \infty\right)$

CAT 2024 Slot 2 - Questions 4-4

4. A function f maps the set of natural numbers to whole numbers, such that $f(xy) = f(x)f(y) + f(x) + f(y)$ for all x, y and $f(p) = 1$ for every prime number p . Then, the value of $f(160000)$ is

24 Nov 2024, Slot 2, Q51

(A) 4095

(B) 8191

(C) 2047

(D) 1023

5. For any non-zero real number x , let $f(x) + 2f\left(\frac{1}{x}\right) = 3x$. Then, the sum of all possible values of x for which $f(x) = 3$, is

24 Nov 2024, Slot 3, Q63

- (A) 3 (B) -2
(C) -3 (D) 2
-

CAT 2023 Slot 3 - Questions 6-6

6. Suppose $f(x, y)$ is a real-valued function such that $f(3x + 2y, 2x - 5y) = 19x$, for all real numbers x and y . The value of x for which $f(x, 2x) = 27$, is

26 Nov 2023, Slot 3, Q66

Type in the answer.

CAT 2022 Slot 1 - Questions 7-8

7. Let $0 \leq a \leq x \leq 100$ and $f(x) = |x - a| + |x - 100| + |x - a - 50|$. Then the maximum value of $f(x)$ becomes 100 when a is equal to

27 Nov 2022, Slot 1, Q48

- (A) 25 (B) 100
(C) 50 (D) 0
-

8. For any real number x , let $[x]$ be the largest integer less than or equal to x . If $\sum_{n=1}^N \left[\frac{1}{5} + \frac{n}{25} \right] = 25$ then N is

27 Nov 2022, Slot 1, Q66

Type in the answer.

CAT 2022 Slot 2 - Questions 9-9

9. Suppose for all integers x , there are two functions f and g such that $f(x) + f(x - 1) - 1 = 0$ and $g(x) = x^2$. If $f(x^2 - x) = 5$, then the value of the sum $f(g(5)) + g(f(5))$ is

27 Nov 2022, Slot 2, Q53

Type in the answer.

CAT 2022 Slot 3 - Questions 10-11

10. Let r be a real number and $f(x) = \begin{cases} 2x - r & \text{if } x \geq r \\ r & \text{if } x < r \end{cases}$. Then, the equation $f(x) = f(f(x))$ holds for all real values of x where

27 Nov 2022, Slot 3, Q59

- (A) $x > r$ (B) $x \leq r$
(C) $x \neq r$ (D) $x \geq r$
-

11. The minimum possible value of $\frac{x^2 - 6x + 10}{3 - x}$, for $x < 3$, is

27 Nov 2022, Slot 3, Q62

- (A) $-\frac{1}{2}$ (B) 2
(C) $\frac{1}{2}$ (D) -2
-

12. For all real values of x , the range of the function $f(x) = \frac{x^2 + 2x + 4}{2x^2 + 4x + 9}$ is:

28 Nov 2021, Slot 2, Q56

(A) $[\frac{4}{9}, \frac{8}{9}]$

(B) $[\frac{3}{7}, \frac{8}{9})$

(C) $(\frac{3}{7}, \frac{1}{2})$

(D) $[\frac{3}{7}, \frac{1}{2})$

CAT 2021 Slot 3 - Questions 13-13

13. If $f(x) = x^2 - 7x$ and $g(x) = x + 3$, then the minimum value of $f(g(x)) - 3x$ is:

28 Nov 2021, Slot 3, Q61

(A) -20

(B) -12

(C) -15

(D) -16

CAT 2020 Slot 1 - Questions 14-15

14. The number of real-valued solutions of the equation $2^x + 2^{-x} = 2 - (x - 2)^2$ is:

29 Nov 2020, Slot 1, Q54

- (A) 1
(B) 2
(C) infinite
(D) 0
-

15. If $f(5 + x) = f(5 - x)$ for every real x , and $f(x) = 0$ has four distinct real roots, then the sum of these roots is

29 Nov 2020, Slot 1, Q75

- (A) 0
(B) 40
(C) 10
(D) 20
-

16. For real x , the maximum possible value of $\frac{x}{\sqrt{1+x^4}}$ is

29 Nov 2020, Slot 2, Q74

(A) $\frac{1}{2}$

(B) 1

(C) $\frac{1}{\sqrt{3}}$

(D) $\frac{1}{\sqrt{2}}$

CAT 2020 Slot 3 - Questions 17-17

17. If $f(x + y) = f(x)f(y)$ and $f(5) = 4$, then $f(10) - f(-10)$ is equal to

29 Nov 2020, Slot 3, Q74

(A) 14.0625

(B) 0

(C) 15.9375

(D) 3

CAT 2019 Slot 1 - Questions 18-20

18. Consider a function f satisfying $f(x + y) = f(x) f(y)$ where x, y are positive integers, and $f(1) = 2$. If $f(a + 1) + f(a + 2) + \dots + f(a + n) = 16(2^n - 1)$ then a is equal to

24 Nov 2019, Slot 1, Q76

Type in the answer.

19. For any positive integer n , let $f(n) = n(n + 1)$ if n is even, and $f(n) = n + 3$ if n is odd. If m is a positive integer such that $8f(m + 1) - f(m) = 2$, then m equals

24 Nov 2019, Slot 1, Q78

Type in the answer.

20. The number of the real roots of the equation $2 \cos(x(x + 1)) = 2^x + 2^{-x}$ is

24 Nov 2019, Slot 1, Q85

- | | |
|--------------|-------|
| (A) 2 | (B) 1 |
| (C) infinite | (D) 0 |
-

CAT 2019 Slot 2 - Questions 21-21

21. Let f be a function such that $f(mn) = f(m)f(n)$ for every positive integers m and n . If $f(1)$, $f(2)$ and $f(3)$ are positive integers, $f(1) < f(2)$, and $f(24) = 54$, then $f(18)$ equals

24 Nov 2019, Slot 2, Q98

Type in the answer.

CAT 2018 Slot 1 - Questions 22-23

22. Let $f(x) = \min(2x^2, 52 - 5x)$ where x is any positive real number. Then the maximum possible value of $f(x)$ is

25 Nov 2018, Slot 1, Q73

Type in the answer.

23. If $f(x + 2) = f(x) + f(x + 1)$ for all positive integers x , and $f(11) = 91$, $f(15) = 617$, then $f(10)$ equals

25 Nov 2018, Slot 1, Q87

Type in the answer.

CAT 2018 Slot 2 - Questions 24-24

24. Let $f(x) = \max(5x, 52 - 2x^2)$, where x is any positive real number. Then the minimum possible value of $f(x)$

25 Nov 2018, Slot 2, Q68

Type in the answer.

25. $f(x) = \frac{5x+2}{3x-5}$ and $g(x) = x^2 - 2x - 1$, then the value of $g(f(f(3)))$ is

26 Nov 2017, Slot 1, Q99

(A) 2

(B) $\frac{1}{3}$

(C) 6

(D) $\frac{2}{3}$

CAT 2017 Slot 2 - Questions 26-27

26. Let $f(x) = x^2$ and $g(x) = 2^x$, for all real x . Then the value of $f[f(g(x)) + g(f(x))]$ at $x = 1$ is

26 Nov 2017, Slot 2, Q89

(A) 16

(B) 18

(C) 36

(D) 40

27. If $f(ab) = f(a)f(b)$ for all positive integers a and b , then the largest possible value of $f(1)$ is

26 Nov 2017, Slot 2, Q97

Type in the answer:

CAT 2008 - Questions 28-28

28. Let $f(x) \neq 0$ for any 'x' be a function satisfying $f(x)f(y) = f(xy)$ for all real x, y. If $f(2) = 4$, then what is the value of $f(\frac{1}{2})$?

16 Nov 2008, Q11

- (A) 0
(B) 1/4
(C) 1/2
(D) 1
(E) cannot be determined
-

CAT 2007 - Questions 29-31

29. A function $f(x)$ satisfies $f(1) = 3600$, and $f(1) + f(2) + \dots + f(n) = n^2 f(n)$, for all positive integers $n > 1$. What is the value of $f(9)$?

18 Nov 2007, Q3

- (A) 80 (B) 240
(C) 200 (D) 100
(E) 120

Questions 30 to 31

Directions for the following two questions:

Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is Rs. 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by 66.67%. However, an increase in daily production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit.

30. How many units should Mr. David produce daily?

18 Nov 2007, Q19

- (A) 130 (B) 100
(C) 70 (D) 150
(E) Cannot be determined

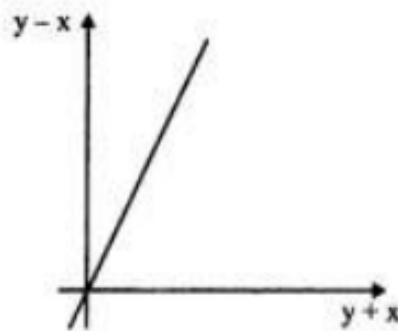
31. What is the maximum daily profit, in rupees, that Mr. David can realize from his business?

18 Nov 2007, Q20

- (A) 620 (B) 920
(C) 840 (D) 760
(E) Cannot be determined

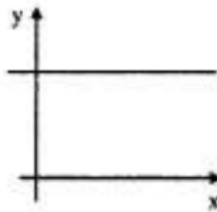
CAT 2006 - Questions 32-33

32. The graph of $y - x$ (on the y axis) against $y + x$ (on the x axis) is as shown below. (All graphs in this question are drawn to scale and the same scale has been used on each axis.)

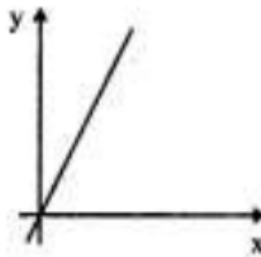


Which of the following shows the graph of y against x ?

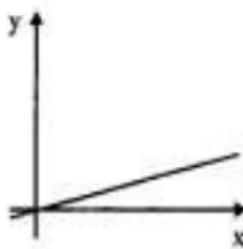
19 Nov 2006, Q65



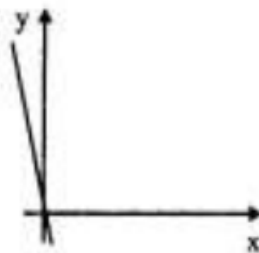
(A)



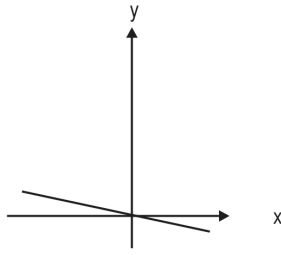
(B)



(C)



(D)



(E)

33. Let $f(x) = \max(2x + 1, 3 - 4x)$, where x is a real number. Then the minimum possible value of $f(x)$ is:

19 Nov 2006, Q72

(A) $1/3$

(B) $1/2$

(C) $2/3$

(D) $4/3$

(E) $5/3$

CAT 2005 - Questions 34-34

34. Let $g(x)$ be a function such that $g(x+1) + g(x-1) = g(x)$ for every real x . Then for what value of p is the relation $g(x+p) = g(x)$ necessarily true for every real x ?

20 Nov 2005, Q27

- | | |
|-------|-------|
| (A) 5 | (B) 3 |
| (C) 2 | (D) 6 |
-

CAT 2004 - Questions 35-37

35. Let $f(x) = ax^2 - b|x|$, where a and b are constants. Then at $x = 0$, $f(x)$ is

21 Nov 2004, Q56

- (A) maximized whenever $a > 0, b > 0$ (B) maximized whenever $a > 0, b < 0$
(C) minimized whenever $a > 0, b > 0$ (D) minimized whenever $a > 0, b < 0$

Questions 36 to 37

Directions for the following two questions:

Answer the questions on the basis of the information given below.

$$f_1(x) = x \text{ if } 0 \leq x \leq 1 \quad f_1(x) = 1 \text{ if } x > 1 \quad f_1(x) = 0 \text{ otherwise}$$

$$f_2(x) = f_1(-x) \text{ for all } x$$

$$f_3(x) = -f_2(x) \text{ for all } x$$

$$f_4(x) = f_3(-x) \text{ for all } x$$

36. How many of the following products are necessarily zero for every x :

$$f_1(x)f_2(x), f_2(x)f_3(x), f_2(x)f_4(x)$$

21 Nov 2004, Q63

- (A) 0 (B) 1
(C) 2 (D) 3

37. Which of the following is necessarily true?

21 Nov 2004, Q64

- (A) $f_4(x) = f_1(x)$ for all x (B) $f_1(x) = -f_3(-x)$ for all x
(C) $f_2(-x) = f_4(x)$ for all x (D) $f_1(x) + f_3(x) = 0$ for all x

Questions 38 to 40

Directions for Questions 38 to 40: Answer the questions on the basis of the tables given below.

Two binary operations $\oplus$ and $*$ are defined over the set $\{a, e, f, g, h\}$ as per the following tables:

$\oplus$	a	e	f	g	h
a	a	e	f	g	h
e	e	f	g	h	a
f	f	g	h	a	e
g	g	h	a	e	f
h	h	a	e	f	g

$*$	a	e	f	g	h
a	a	a	a	a	a
e	a	e	f	g	h
f	a	f	h	e	g
g	a	g	e	h	f
h	a	h	g	f	e

Thus, according to the first table $f \oplus g = a$, while according to the second table $g * h = f$, and so on. Also, let $f^2 = f * f$, $g^3 = g * g * g$, and so on.

38. What is the smallest positive integer n such that $g^n = e$?

15 Feb 2004, CAT 2003 Re-test, Q94

- (A) 4 (B) 5
(C) 2 (D) 3

39. Upon simplification, $f \oplus [f * \{f \oplus (f * f)\}]$ equals

15 Feb 2004, CAT 2003 Re-test, Q95

- (A) e (B) f
(C) g (D) h

40. Upon simplification, $\{a^{10} * (f^{10} \oplus g^9)\} \oplus e^8$ equals

15 Feb 2004, CAT 2003 Re-test, Q96

- (A) e (B) f
(C) g (D) h

41. The number of non-negative real roots of $2^x - x - 1 = 0$ equals

23 Nov 2003, CAT 2003 Original sitting, Q105

- (A) 0 (B) 1
(C) 2 (D) 3

42. When the curves $y = \log_{10}x$ and $y = x^{-1}$ are drawn in the x-y plane, how many times do they intersect for values $x \geq 1$?

23 Nov 2003, CAT 2003 Original sitting, Q106

- (A) Never (B) Once
(C) Twice (D) More than twice

43. Let $g(x) = \max(5 - x, x + 2)$. The smallest possible value of $g(x)$ is

23 Nov 2003, CAT 2003 Original sitting, Q116

- (A) 4.0 (B) 4.5
(C) 1.5 (D) None of the above

44. The function $f(x) = |x - 2| + |2.5 - x| + |3.6 - x|$, where x is a real number, attains a minimum at

23 Nov 2003, CAT 2003 Original sitting, Q117

- (A) $x = 2.3$ (B) $x = 2.5$
(C) $x = 2.7$ (D) None of the above

45. Consider the following two curves in the x-y plane: $y = x^3 + x^2 + 5$ and $y = x^2 + x + 5$. Which of the following statements is true for $-2 \leq x \leq 2$?

23 Nov 2003, CAT 2003 Original sitting, Q145

- (A) The two curves intersect once. (B) The two curves intersect twice.
(C) The two curves do not intersect (D) The two curves intersect thrice.

46. If $f(x) = \log \frac{(1+x)}{(1-x)}$, then $f(x) + f(y)$ is

CAT 2002, Q54

- (A) $f(x+y)$ (B) $f \frac{(x+y)}{(1+xy)}$
 (C) $(x+y)f \frac{1}{(1+xy)}$ (D) $\frac{f(x)+f(y)}{(1+xy)}$

47. A car rental agency has the following terms. If a car is rented for 5 hr or less, then, the charge is Rs. 60 per hour or Rs. 12 per kilometre whichever is more. On the other hand, if the car is rented for more than 5 hr, the charge is Rs. 50 per hour or Rs. 7.50 per kilometre whichever is more. Akil rented a car from this agency, drove it for 30 km and ended up paying Rs. 300. For how many hours did he rent the car?

CAT 2002, Q73

- (A) 4 hr (B) 5 hr
 (C) 6 hr (D) None of these

48. Suppose for any real number x , $[x]$ denotes the greatest integer less than or equal to x . Let $L(x, y) = [x] + [y] + [x+y]$ and $R(x, y) = [2x] + [2y]$. Then it is impossible to find any two positive real numbers x and y for which

CAT 2002, Q75

- (A) $L(x, y) = R(x, y)$ (B) $L(x, y) \neq R(x, y)$
 (C) $L(x, y) < R(x, y)$ (D) $L(x, y) > R(x, y)$

49. Davji Shop sells samosas in boxes of different sizes. The samosas are priced at Rs. 2 per samosa up to 200 samosas. For every additional 20 samosas, the price of the whole lot goes down by 10 paise per samosa. What should be the maximum size of the box that would maximise the revenue?

CAT 2002, Q96

- (A) 240 (B) 300
 (C) 400 (D) None of these

50.

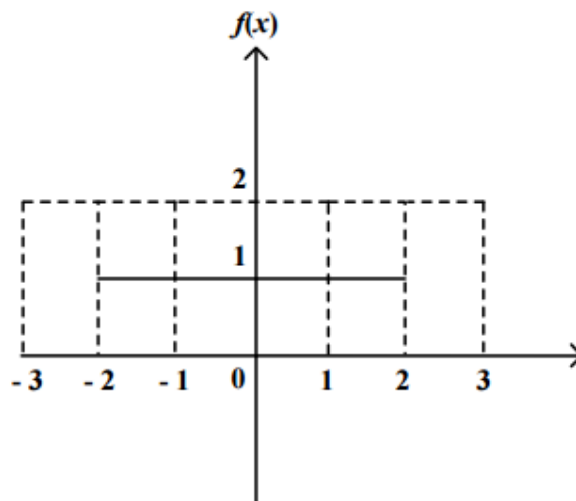
x	1	2	3	4	5	6
y	4	8	14	22	32	44

CAT 2000, Q57

- (A) $y = a + bx$ (B) $y = a + bx + cx^2$
(C) $y = e^{a+bx}$ (D) None of the above

a) if $f(x) = 3f(-x)$
b) if $f(x) = -f(-x)$
c) if $f(x) = f(-x)$
d) if $3f(x) = 6f(-x)$, for $x \geq 0$

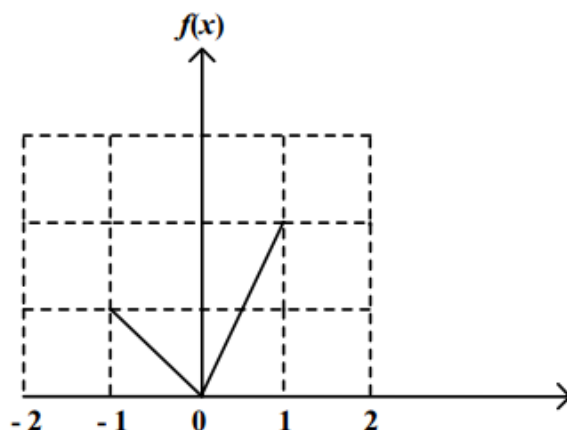
51.



CAT 2000, Q82

- (A) if $f(x)=3f(-x)$
 (B) if $f(x)=-f(-x)$
 (C) if $f(x)=f(-x)$
 (D) if $3f(x)=6f(-x)$, for $x \geq 0$

52.



CAT 2000, Q83

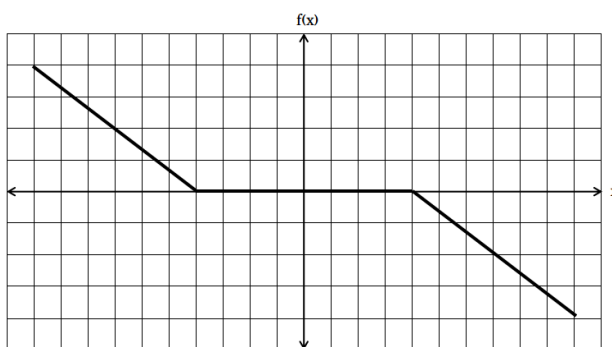
(A) if $f(x) = 3f(-x)$

(B) if $f(x) = -f(-x)$

(C) if $f(x) = f(-x)$

(D) if $3f(x) = 6f(-x)$, for $x \geq 0$

53.



CAT 2000, Q84

(A) if $f(x) = 3f(-x)$

(B) if $f(x) = -f(-x)$

(C) if $f(x) = f(-x)$

(D) if $3f(x) = 6f(-x)$, for $x \geq 0$

Questions 54 to 55

Directions for the next 2 questions:

For a real number x , let

$f(x) = 1/(1+x)$, if x is non-negative

$f(x) = 1+x$, if x is negative

$f^n(x) = f(f^{n-1}(x))$, $n = 2, 3, \dots$

54. What is the value of the product, $f(2)f^2(2)f^3(2)f^4(2)f^5(2)$?

CAT 2000, Q87

(A) $1/3$

(B) 3

(C) $1/18$

(D) None of these

55. r is an integer ≥ 2 . Then, what is the value of $f^{r-1}(-r) + f^r(-r) + f^{r+1}(-r)$?

CAT 2000, Q88

- (A) -1
(B) 0
(C) 1
(D) None of these
-

56. The set of all positive integers is the union of two disjoint subsets: $\{f(1), f(2), \dots, f(n), \dots\}$ and $\{g(1), g(2), \dots, g(n), \dots\}$, where $f(1) < f(2) < \dots < f(n) < \dots$, and $g(1) < g(2) < \dots < g(n) < \dots$, and $g(n) = f(f(n)) + 1$ for all $n \geq 1$. What is the value of $g(1)$?

CAT 2000, Q105

- (A) Zero
(B) Two
(C) One
(D) Cannot be determined
-

57. For all non-negative integers x and y , $f(x, y)$ is defined as below: $f(0, y) = y + 1$, $f(x + 1, 0) = f(x, 1)$, $f(x + 1, y + 1) = f(x, f(x + 1, y))$. Then, what is the value of $f(1, 2)$?

CAT 2000, Q107

- (A) Two
(B) Four
(C) Three
(D) Cannot be determined
-

Questions 58 to 60

Answer the questions based on the following information. The following operations are defined for real numbers.

$a \# b = a + b$, if a and b both are positive else $a \# b = 1$

$a \nabla b = (a \times b)^{a+b}$ if $a \times b$ is positive else $a \nabla b = 1$.

58. $\frac{(2\#1)}{(1\nabla2)} =$

CAT 1998, Q57

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

59. $\frac{((1\#1)\#2) - (10^{1.3} \nabla \log_{10} 0.1)}{1\nabla2}$

CAT 1998, Q58

- (A) $\frac{3}{8}$ (B) $\frac{4 \cdot \log_{10} 0.1}{8}$
(C) $\frac{(4 + 10^{13})}{8}$ (D) None of these

60. $\left(\frac{(X\# - Y)}{(-X \nabla Y)} \right) = \frac{3}{8}$, then which of the following must be true?

CAT 1998, Q59

- (A) $X = 2, Y = 1$ (B) $X > 0, Y < 0$
(C) X, Y both positive (D) X, Y both negative

Questions 61 to 63

For these questions the following functions have been defined.

$$la(x, y, z) = \min(x + y, y + z)$$

$$le(x, y, z) = \max(x - y, y - z)$$

$$ma(x, y, z) = \frac{1}{2}(le(x, y, z) + la(x, y, z))$$

61. Given that $x > y > z > 0$. Which of the following is necessarily true?

CAT 1997, Q128

- (A) $la(x, y, z) < le(x, y, z)$ (B) $ma(x, y, z) < la(x, y, z)$
 (C) $ma(x, y, z) < le(x, y, z)$ (D) None of these

62. What is the value of $ma(10, 4, le(la(10, 5, 3), 5, 3))$?

CAT 1997, Q129

- (A) 7 (B) 6.5
 (C) 8 (D) 7.5

63. For $x=15$, $y=10$ and $z=9$, find the value of $le(x, \min(y, x-z), le(9, 8, ma(x, y, z)))$.

CAT 1997, Q130

- (A) 5 (B) 12
 (C) 9 (D) 4

64. A, B and C are defined as follows. $A = (2.000004) \div ((2.000004)^2 + 4.000008)$; $B = (3.000003) \div ((3.000003)^2 + 9.000009)$; $C = (4.000002) \div ((4.000002)^2 + 8.000004)$ Which of the following is true about the values of the above three expressions?

CAT 1997, Q133

- (A) All of them lie between 0.18 and 0.2 (B) A is twice of C
 (C) C is the smallest (D) B is the smallest

Questions 65 to 66

Answer the questions based on the following information. A, S, M and D are functions of x and y, and they are defined as follows.

$$A(x, y) = x + y$$

$$S(x, y) = x - y$$

$$M(x, y) = xy$$

$$D(x, y) = \frac{x}{y}, y \neq 0$$

65. What is the value of $M(M(A(M(x, y), S(y, x)), x), A(y, x))$ for $x = 2, y = 3$?

CAT 1996, Q115

(A) 60

(B) 140

(C) 25

(D) 70

66. What is the value of $S[M(D(A(a, b), 2), D(A(a, b), 2)), M(D(S(a, b), 2), D(S(a, b), 2))]$?

CAT 1996, Q116

(A) $a^2 + b^2$

(B) ab

(C) $a^2 - b^2$

(D) $\frac{a}{b}$

CAT 1991 - Questions 67-69

67. A function can sometimes reflect on itself, i.e. if $y = f(x)$, then $x = f(y)$. Both of them retain the same structure and form. Which of the following functions has this property?

CAT 1991, Q61

- (A) $y = \frac{2x+3}{3x+4}$ (B) $y = \frac{2x+3}{3x-2}$
(C) $y = \frac{3x+4}{4x-5}$ (D) None of the above
-

68. If $y = f(x)$ and $f(x) = \frac{(1-x)}{(1+x)}$, which of the following is true?

CAT 1991, Q74

- (A) $f(2x) = f(x) - 1$ (B) $x = f(2y) - 1$
(C) $f(1/x) = f(x)$ (D) $x = f(y)$
-

69. Let $Y = \text{minimum of } \{(x+2), (3-x)\}$. What is the maximum value of Y for $0 \leq x \leq 1$?

CAT 1991, Q79

- (A) 1.0 (B) 1.5
(C) 3.1 (D) 2.5
-

CAT 1990 - Questions 70-70

70. From any two numbers x and y , we define $x * y = x + 0.5y - xy$. Suppose that both x and y are greater than 0.5. Then $x * x < y * y$ if

CAT 1990, Q20

(A) $1 > x > y$

(B) $x > 1 > y$

(C) $1 > y > x$

(D) $y > 1 > x$

- End of PYQ Collection -
