



MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

GETTING STARTED WITH GRAPHS

Illustration 11

1. Does the following graph represent a function or a relation?







Illustration 12

1. Does the graph below represent a function or a relation?

`(##CEN_GRA_C01_S01_002_Q01.png" width="80%">

D View Text Solution

Illustration 13

1. Does the following graph pass the vertical or horizontal line

test?



Watch Video Solution

Illustration 14

1. In how many points graph of $y = x^3 - 3x^2 + 5x - 3$ interest

the x-axis?



Illustration 15

1. Following is the graph of y = f(x).









1. Which of the following pair of graphs intersect ?

(i) y =
$$x^2 - x$$
 and y = 1

(ii) y =
$$x^2-2x+3$$
 and y = sin x

(iii) =
$$x^2 - x + 1$$
 and y = x - 4

Watch Video Solution

Illustration 17

1. The graph of y = f(x) is shown, find the number of solution of

f(f(x)) = 2.





Illustration 18

1. Does the graph of the function $f(x)=x^2-3$ have y - axis

symmetry?

Watch Video Solution

Illustration 19

1. Does the graph of the function $f(x)=1/x^3$ have origin

symmetry?

Watch Video Solution

1. Check whether the function has (have) y-symmetry or origin symmetry: $f(x) = x^2 \sin x$.

Watch Video Solution

Illustration 111

1. Let $f: R \to R$ be a continuous onto function satisfying f(x) + f(-x) = 0, $\forall x \in R$. If f(-3) = 2 and f(5) = 4 in [-5, 5], then what is the minimum number of roots of the equation f(x) = 0?

Watch Video Solution

1. Let $f: R \to R$ and $g: R \to R$ be two one-one and onto functions such that they are mirror images of each other about the line y = a. If h(x) = f(x) + g(x), then h(x) is (A) one-one onto (B) one-one into (C) many-one into (D) many-one onto

Watch Video Solution

Illustration 1 13

1. Check weather the following function/functions is/are periodic or not? Find the period in case the function is periodic.



Watch Video Solution

Illustration 1 14

1. Draw the graph of
$$f(x)=\left\{(x-2n,2n\leq x<2n+1),\left(rac{1}{2},2n+1\leq x<2n+2
ight)
ight\}$$

periodic? If yes, what is its period?

Watch Video Solution

Illustration 115

1. The graph of y = f(x) is as shown in the following figure.

Find the following values:



Illustration 1 16

1. The graph of y = f(x) is as shown in the following figure.



Identify the points of discontinuity and give the reason for the

same.



1. The graph of f(x) is given. State with reasons the number at which the function is non-differentiable.



Watch Video Solution

Illustration 1 18

1. For each of the following graphs, comment whether f(x) is increasing or decreasing or neither increasing nor decreasing at x

= a.





Illustration 1 19

1. The graph of a function is shown in the following figure.



Determine the intervals on which the function is concave up and

the intervals on which it is concave down. Find the x - coordinates

of any inflection points.



Illustration 1 20

1. For the function g whose graph is given. Arrange the following numbers in increasing order and explain your reasoning.





Illustration 1 21

1. The diagram shows the graph of the derivative of a functin f(x) for $0 \le x \le 4$ with f(0) = 0. Which of the following could be





(a) Tangent line to y = f(x) at x = 0 makes an angle of $\sec^{-1}\sqrt{5}$ with the x - axis.

(b) f is increasing in (0, 3).

(c) x = 1 is both an inflection point and the point of local extremum.

(d) Number of critical point on y = f(x) is two.



1. In the following graph, state the absolute and local maximum and minimum values of the function.





Illustration 1 23

1. The graph of the derivative f'(x) is given in the following figure.

(b) Find the values of x for which f has local maximum or

minimum.

(c) Find the intervals in which f is concave upward or downward.

(d) Find the point of inflection.



Watch Video Solution

Illustration 1 24

1. The graph of the second derivation f''(x) is given in the following figure. State the x - coordinate of the point of inflection

of f. Given reasons for your answer.







1. The figure shows the graphs of f, f' and f". Identify each curve

and explain your choices.

`(##CEN_GRA_C01_S01_025_Q01.png" width="80%">

View Text Solution

1. Following is the graph of y = f'(x), given that f(c) = 0. Analyse the graph and answer the following questions.

(a) How many times the graph of y = f(x) will intersect the x - axis? (b) Discuss the type of roots of the equation $f(x) = 0, a \le x \le b$. (c) How many points of inflection the graph of $y = f(x), a \le x \le b$, has?

(d) Find the points of local maxima/minima of $y=f(x),\,a< xb.$ (e) How many roots equation $f'\,'(x)=0$ has?





1. Find the horizontal, vertical and oblique asymptotes of each of the curves.

Watch Video Solution

1. Does the following graph pass the vertical or horizontal line

test?







1. Consider the graph of y = f(x) as shown in the following figure.



(i) Find the sum of the roots of the equation f(x) = 0.

(ii) Find the product of the roots of the equation f(x) = 4.

(iii) Find the absolute value of the difference of the roots of the equation f(x) = x+2.



Discuss the symmetry.





1. Check weather the following function/functions is/are periodic or not? Find the period in case the function is periodic.



1. Suppose that f is even, periodic function with period 2, and that

f(x) = x for all x in the interval [0, 1]. Then draw the graph of y =

f(x).



1. The graph of y = f(x) is as shown in the following figure.



Find the following values

 $\begin{array}{ll} \text{(i)} f(-3) & (ii) f(-2) & (iii) f(0) \\ \text{(iv)} f(2) & (v) f(3) & (vi) \lim_{x \to -3} f(x) \\ \text{(vii)} \lim_{x \to 0} f(x) & (viii) \lim_{x \to 2} f(x) & (ix) \lim_{x \to 3} f(x) \\ \text{(x)} \lim_{x \to 2^{-}} f(x) & (\xi) \lim_{x \to -2^{+}} f(x) & (xii) \lim_{x \to 0^{-}} f(x) \\ \text{(x iii)} \lim_{x \to 0^{+}} f(x) \end{array}$

Watch Video Solution

1. The graph of f is shown. State, with reason, the numbers at which f is not differentiable.





Exercises 19

1. Select the right option regarding the given graph.



1. (a) Can the graph of the function intersect the horizontal asymptote?

(b) Can the graph of the function intersect the vertical asymptote?



1. The graph of y = f(x) is given with six labelled points. Anser the

following questions.

(a) At which point f'(x) has the greatest value?

(b) At which point f(x) and f'(x) both are zero?

(c) At how many point f'(x) is negative ?

(d) Which is the point of infection?



1. Graph of functions are given in the following figure. Check the

functions for absolute extremum.



1. Given the graph of the function y = f(x), draw the graph of $y = \operatorname{sgn}(x)$.



1. Find the intervals in which $f(x) = x^2 + 2x - 5$ is increasing or

decreasing.

Watch Video Solution

1. Find all the points of local maxima and local minima of the

function $f(x) = x^3 - 6x^2 + 12x - 8$.

Watch Video Solution

Exercises 1 16

1. The figure shows the graphs of f, f' and f". Indentify each curve

and explain your choices.







1. Match the graph of y = f(x) in Column I with the corresponding

graph of y = f'(x) in Column II.







Exercises 1 18

1. Following is the graph of y = f'(x) and f(0) = 0.



- (a) What type of function y = f'(x) is ? Odd or even?
- (b) What type of function y = f(x) is ? Odd or even?
- (c) What is the value of $\int_{-a}^{a} f(x) dx$?
- (d) Has y = f(x) point of inflection?
- (e) What is the nature of y = f(x)? Monotonic or non-monotonic?

Watch Video Solution