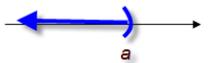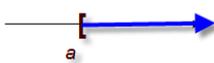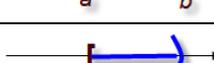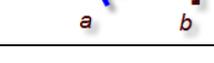# Module 4.A : Graphing

Learning Objectives:
1. **Find the coordinates of a point on the Cartesian Coordinate Plane.**
2. **Convert a line graph to interval notation.**
3. **Determine the intervals where a function is increasing, decreasing or constant.**
4. **Given a table of points, evaluate a function.**
5. **Determine if the given point is on the line.**
6. **Find the intercepts for the graph of a line equation.**
7. Evaluate a linear function, given two points on the graph of the line.
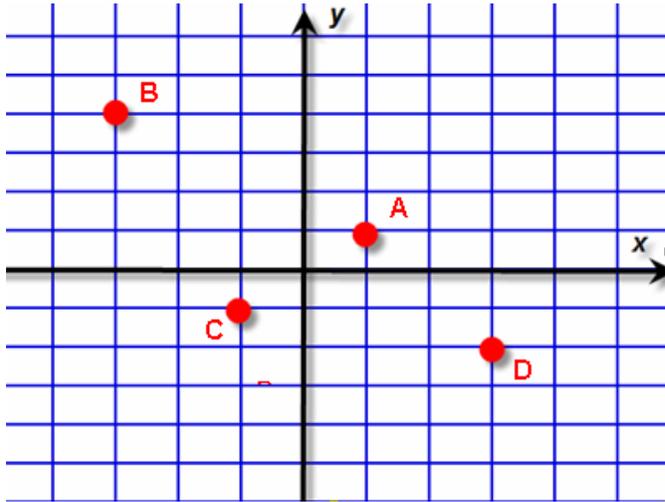8. **Draw a graph representing a second degree equation.**

Summary of Interval Notation

Inequality	Interval Notation	Graph on Number Line
$x > a$	(a, ∞)	
$x < a$	$(-\infty, a)$	
$x \geq a$	$[a, \infty)$	
$x \leq a$	$(-\infty, a]$	
$a < x < b$	(a, b)	
$a \leq x < b$	$[a, b)$	
$a < x \leq b$	$(a, b]$	
$a \leq x \leq b$	$[a, b]$	

SECTION 1 : Find the coordinates of a point on the Cartesian Coordinate Plane.

EXERCISE 1
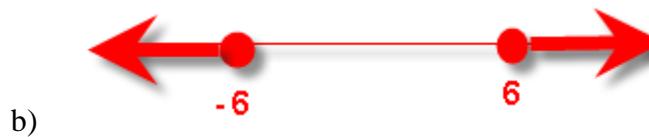
Find the coordinates of the points A, B, C and D below.

SOLUTION

A (1, 1),   B (-3, 4),   C(-1, -1),   D(3, -2).

SECTION 2 : Convert a line graph to interval notation.
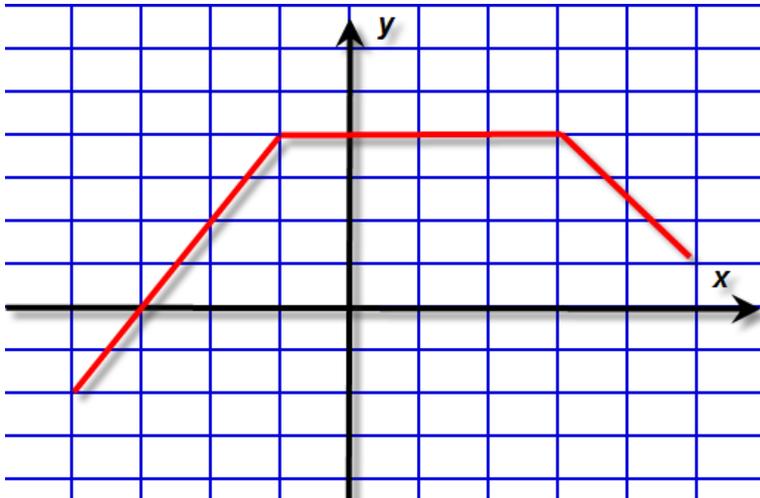
EXERCISE 2

Write the following in interval notation.

a)

b)

SOLUTION

a) $[11,13)$ b) $(-\infty,-6]\cup[6,\infty)$ Alternatively, we could write $|x|\geq 6$,

which is the same as $x\leq -6$ or $x\geq 6$.

Four.3 Determine the intervals where a function is increasing, decreasing or constant.

EXERCISE 3

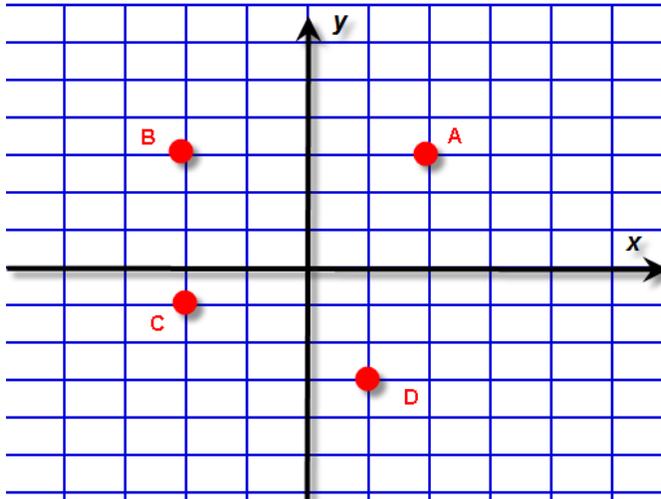On what intervals is the graph below increasing, decreasing and constant.

SOLUTION

You need to write all intervals in terms of the x-coordinates, only.
Increasing on (-4, -1), constant on (-1, 3), decreasing on (3, 5).

MODULE 4.A - ASSESSMENT

_____1. Find the coordinates of the points B and D below.

A $(-2,4)$ and $(1,-3)$ **B** $(3,-2)$ and $(-1,3)$ **C** $(2,2)$ and $(1,-3)$
D $(-2,3)$ and $(1,-3)$ **E** I do not know
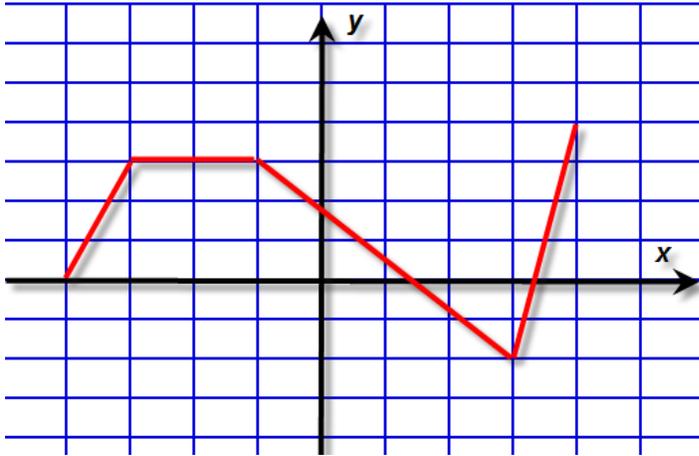
_____2. Write the following in interval notation.

A $(-5,-2]$ **B** $(-5,-2)$ **C** $[-5,-2]$ **D** $[-5,-2)$
E I do not know

_____3. Write the following in interval notation.

A $(-\infty,-4)\cup[2,\infty)$ **B** $(-\infty,-4]\cup[2,\infty)$ **C** $[-4,2]$
D $(-\infty,-4)\cup(2,\infty)$ **E** I do not know

_____**4**. For the graph of f below , which one of the following statements is true?

A f is strictly increasing on $(-4,-3)$ and strictly decreasing on $(-1,-3)$

B f is strictly increasing on $(-2,4)$ and strictly decreasing on $(-2,3)$

C f is strictly increasing on $(-4,-1)$ and $(3,4)$, and strictly decreasing on $(-1,3)$

D f is strictly increasing on $(-4,-3)$ and $(3,4)$, and strictly decreasing on $(-1,3)$

E I do not know