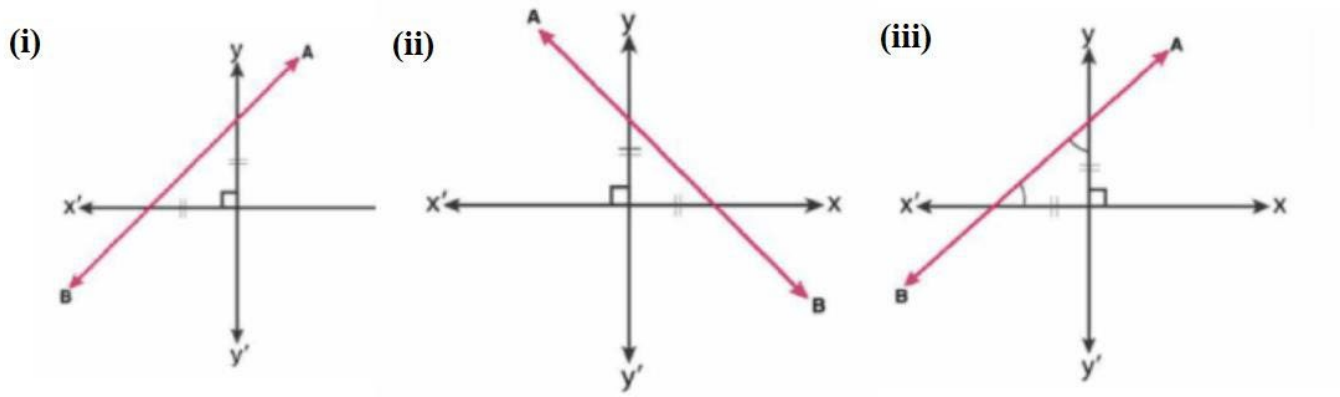
EXERCISE 26C

1. In each of the following, find the inclination of line AB:



Solution:

The angle which is a straight line makes with the positive direction of x-axis (measured in anticlockwise direction) is called as inclination of the line.
(i) The inclination of line AB is $\theta = 45^0$
(ii) The inclination of line AB is $\theta = 135^0$
(iii) The inclination of line AB is $\theta = 30^0$

2. Write the inclination of a line which is:
(i) Parallel to x-axis.
(ii) Perpendicular to x-axis.
(iii) Parallel to y-axis.
(iv) Perpendicular to y-axis.
Solution:

(i) The inclination of a line which is parallel to x-axis is $\theta = 0^0$.

(ii) The inclination of a line which is perpendicular to x-axis is $\theta = 90^0$.

(iii) The inclination of a line which is parallel to y-axis is $\theta = 90^0$.

(iv) The inclination of a line which is perpendicular to y-axis $\theta = 0^0$.

3. Write the slope of the line whose inclination is:
(i) 0^0
(ii) 30^0
(iii) 45^0
(iv) 60^0
Solution:

The slope of the line is tan θ if θ is the inclination of a line.
Here slope is usually denoted by the letter m.

(i) The inclination of a line is 0^0 then $\theta = 0^0$.
Therefore, the slope of the line is $m = \tan 0^0 = 0$

(ii) The inclination of a line is 30^0 then $\theta = 30^0$.
Therefore, the slope of the line is $m = \tan \theta = \tan 30^0 = 1/\sqrt{3}$

(iii) The inclination of a line is 45^0 then $\theta = 45^0$.
Therefore, the slope of the line is $m = \tan \theta = \tan 45^0 = 1$

(iv) The inclination of a line is 60^0 then $\theta = 60^0$.
Therefore, the slope of the line is $m = \tan \theta = \tan 60^0 = \sqrt{3}$

4. Find the inclination of the line whose slope is:
(i) 0
(ii) 1
(iii) $\sqrt{3}$
(iv) $1/\sqrt{3}$
Solution:

If $\tan \theta$ is the slope of a line; then the inclination of the line is θ

(i) If the slope of the line is 0; then $\tan \theta = 0$
$\tan \theta = 0$
$\tan \theta = \tan 0^0$
$\theta = 0^0$
Hence, the inclination of the given line is $\theta = 0^0$.

(ii) If the slope of the line is 1; then $\tan \theta = 1$
$\tan \theta = 1$
$\tan \theta = \tan 45^0$
$\theta = 45^0$
Hence, the inclination of the given line is $\theta = 45^0$.

(iii) If the slope of the line is $\sqrt{3}$; then $\tan \theta = \sqrt{3}$
$\tan \theta = \sqrt{3}$
$\tan \theta = \tan 60^0$
$\theta = 60^0$
Hence, the inclination of the given line is $\theta = 60^0$.

(iv) If the slope of the line is $1/\sqrt{3}$; then $\tan \theta = 1/\sqrt{3}$
$\tan \theta = 1/\sqrt{3}$
$\tan \theta = \tan 30^0$
$\theta = 30^0$
Hence, the inclination of the given line is $\theta = 30^0$.

5. Write the slope of the line which is:
(i) Parallel to x-axis.
(ii) Perpendicular to x-axis.
(iii) Parallel to y-axis.
(iv) Perpendicular to y-axis.
Solution:

(i) We know that the inclination of line parallel to x-axis $\theta = 0^0$
So the slope (m) = $\tan \theta = \tan 0^0 = 0$

(ii) We know that the inclination of line perpendicular to x-axis $\theta = 90^0$
So the slope (m) = $\tan \theta = \tan 90^0 = \infty$ (not defined)

(iii) We know that the inclination of line parallel to y-axis $\theta = 90^0$
So the slope (m) = $\tan \theta = \tan 90^0 = \infty$ (not defined)

(iv) We know that the inclination of line perpendicular to y-axis $\theta = 0^0$
So the slope (m) = $\tan \theta = \tan 0^0 = 0$