

Chapter 10 Topics in Analytic Geometry

Section 10.1 Lines

Objective: In this lesson you learned how to find the inclination of a line, the angle between two lines, and the distance between a point and a line.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Inclination (of a nonhorizontal line) **The positive angle θ (less than π) measured counterclockwise from the x -axis to the line.**

Angle between two lines **The smaller angle of the two pairs of opposite angles (one acute and one obtuse) formed by the intersection of two distinct lines in a plane.**

I. Inclination of a Line (Pages 726–727)

Every nonhorizontal line must intersect the x -axis.

The angle formed by such an intersection determines the inclination of the line.

If a nonvertical line has inclination θ and slope m , then $m = \underline{\tan \theta}$.

Example 1: Find the inclination of the line given by

$$y = \frac{1}{2}x + 5.$$

0.4636 radians or 26.565°

What you should learn

How to find the inclination of a line

II. The Angle Between Two Lines (Pages 727–728)

If two nonperpendicular lines have slopes m_1 and m_2 , the angle between the two lines is given by

$$\tan \theta = \frac{|(m_2 - m_1)/(1 + m_1 m_2)|}{}$$

Example 2: Find the angle between the two lines: $y = -4x + 1$ and $y = 3x - 2$.

0.5667 radians or 32.471°

What you should learn

How to find the angle between two lines

III. The Distance Between a Point and a Line

(Pages 728–729)

The distance between a line and a point not on the line is defined as the length of the perpendicular line segment joining the point to the given line.

The distance between the point (x_1, y_1) and the line $Ax + By + C = 0$

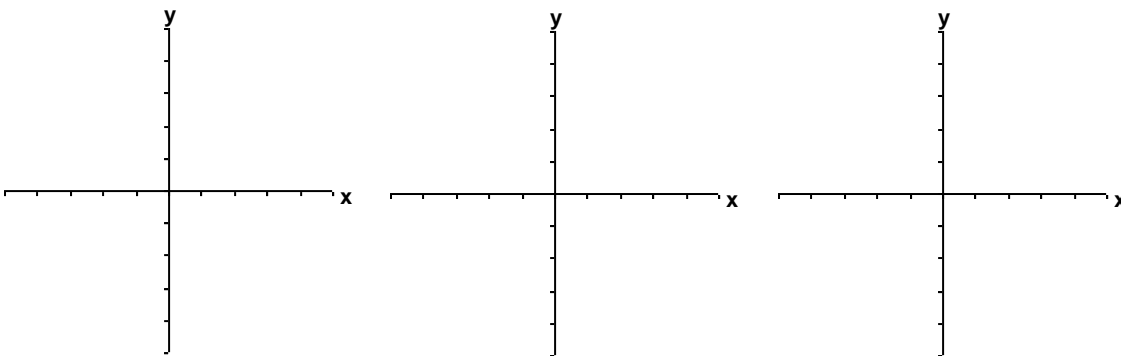
is $d = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$.

Example 3: Find the distance between the point $(1, 1)$ and the line $y = 6 - 3x$.

The distance between the point and the line is 0.6325.

What you should learn

How to find the distance between a point and a line

Additional notes**Homework Assignment**

Page(s)

Exercises