

Mini-Lecture 2.4

Linear Functions and Models

Learning Objectives:

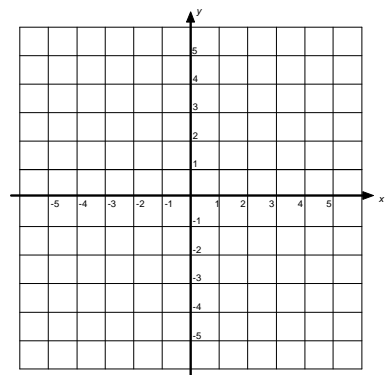
1. Graph linear functions.
2. Find the zero of a linear function.
3. Build linear models from verbal descriptions
4. Build linear models from data.

Preparing for Linear Functions and Models:

i) Solve for x : $\frac{2}{3}x + 4 = 0$.

ii) Graph using the point-plotting method:

$$3x - 2y = 6.$$



Examples:

DEFINITION

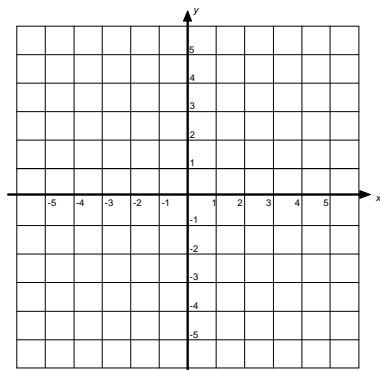
A **linear function** is a function of the form

$$f(x) = mx + b$$

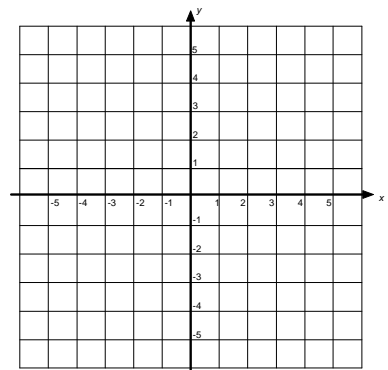
where m and b are real numbers. The graph of a linear function is called a **line**.

1. Graph each linear function.

a) $f(x) = -6x - 2$



b) $f(x) = \frac{4}{3}x - 4$



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2. Find the zero of $H(x) = -\frac{3}{2}x + 6$.

3. Use the set of data points below.

x	1	4	3	6
y	18	8	10	2

- a) Draw a scatter diagram of the data.



- b) Select two points from the scatter diagram and find the equation of line containing the two points selected.
- c) Graph the line found in part b) on the scatter diagram.
4. **Perimeter of a Rectangle** In a given rectangle, the length is 3 ft less than twice the width. If x represents the width of the rectangle, the perimeter can be calculated by the function: $P(x) = 2x + 2(2x - 3)$.
- a) What is the implied domain of the function?
- b) What are the dependent and independent variables?

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- c) What is the perimeter of a rectangle whose width is 12 ft?
- d) What is the width of a rectangle whose perimeter is 84 ft?