2.4 Linear Functions

Learning Objectives:
- Graph linear equations efficiently.
- Determine the equation of a line given two points.
- Interpret Cost, Revenue, and Profit Functions, especially Breakeven Points.

Graphing Linear Functions

Two most basic ways to graph a linear function are ______________________________
_______________________________________________________________________.

x-intercept: ______________________________
y-intercept: ______________________________

Example: \( f(x) = -2x + 6 \)

Intercepts:

x-intercept:
____________________________
____________________________
____________________________

Ordered Pair: ________________

y-intercept:
____________________________
____________________________

Ordered Pair: ________________

Points:

\( x=0 \): ______________________

\( x=1 \): ______________________
____________________________
____________________________

\( x=2 \): ______________________
____________________________
____________________________

\( x=3 \): ______________________
What if all we have is the graph of a line?

A line is __________________________, where _________________________ and ___________________________

\[ m = \] _____________________________

Example:

\[ b = \] _____________________________

Pick order pairs: ______________________

Label them: __________________________

\[ m = \] _____________________________

The equation is ________________

\[ \text{Determining a Line’s Equation} \]

Example 1: Find the equation of a line with slope 5 passing through the point (-1,3).

Point Slope Form of a Line: _____________________________

Plugging in: _____________________________

Example 2: Find the equation of the vertical like passing through (2,-3).

What kind of slope? _____________________________

Equation: _____________________________

Find the equations of the lines below.

Example 3:
Calculate the slope: ________________________________________________

Plug into equation: _________________________________________________

Example 4:

Cost, Revenue, and Profit Functions

The manager of a bicycle company has determined that the total cost in dollars, \( C(x) \), of producing a number of bicycles is given by, \( C(x) = 90x + 1800 \), while the revenue in dollars, \( R(x) \), from the sale of \( x \) number of bicycles is given by \( R(x) = 150x \).
(a) What is the cost of manufacturing 14 bicycles in a day?

Step 1: ________________

Step 2: ________________

Step 3: _______________________  and  ___________

Step 4: ________________

Step 5: _______________________

THE ANSWER IS … ____________________________

(b) Find the break-even point and the cost and revenue at the break-even point.

Step 1: _____________________________

Step 2: _____________________________

Step 3: _____________________________

Step 4: Break-even: _____________________________

______________________________

______________________________

Cost: _____________________________

______________________________

Revenue: _____________________________

______________________________

Step 5: _____________________________

THE ANSWER IS … Break-even: _____________________________

Cost at Break-even point: _____________________________

Revenue at Break-even point: _____________________________