Lesson 4
Linear Functions

What You'll Learn

Scan the lesson. List two real-world scenarios in which you would use functions.

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Real-World Link

Up, Up, and Away The Lockheed SR-71 Blackbird has a top speed of 36.6 miles per minute. If x represents the minutes traveled at this speed, the function rule for the distance traveled is $y = 36.6x$.

1. Complete the function table.

Input	x	1	2	3	4
Rule	$36.6x$	$36.6(1)$	$36.6(2)$		
Output	y	36.6			
(Input, Output)	(x, y)	$(1, 36.6)$			

2. Graph the ordered pairs (x, y) on the coordinate plane provided. What do you notice about the graph?

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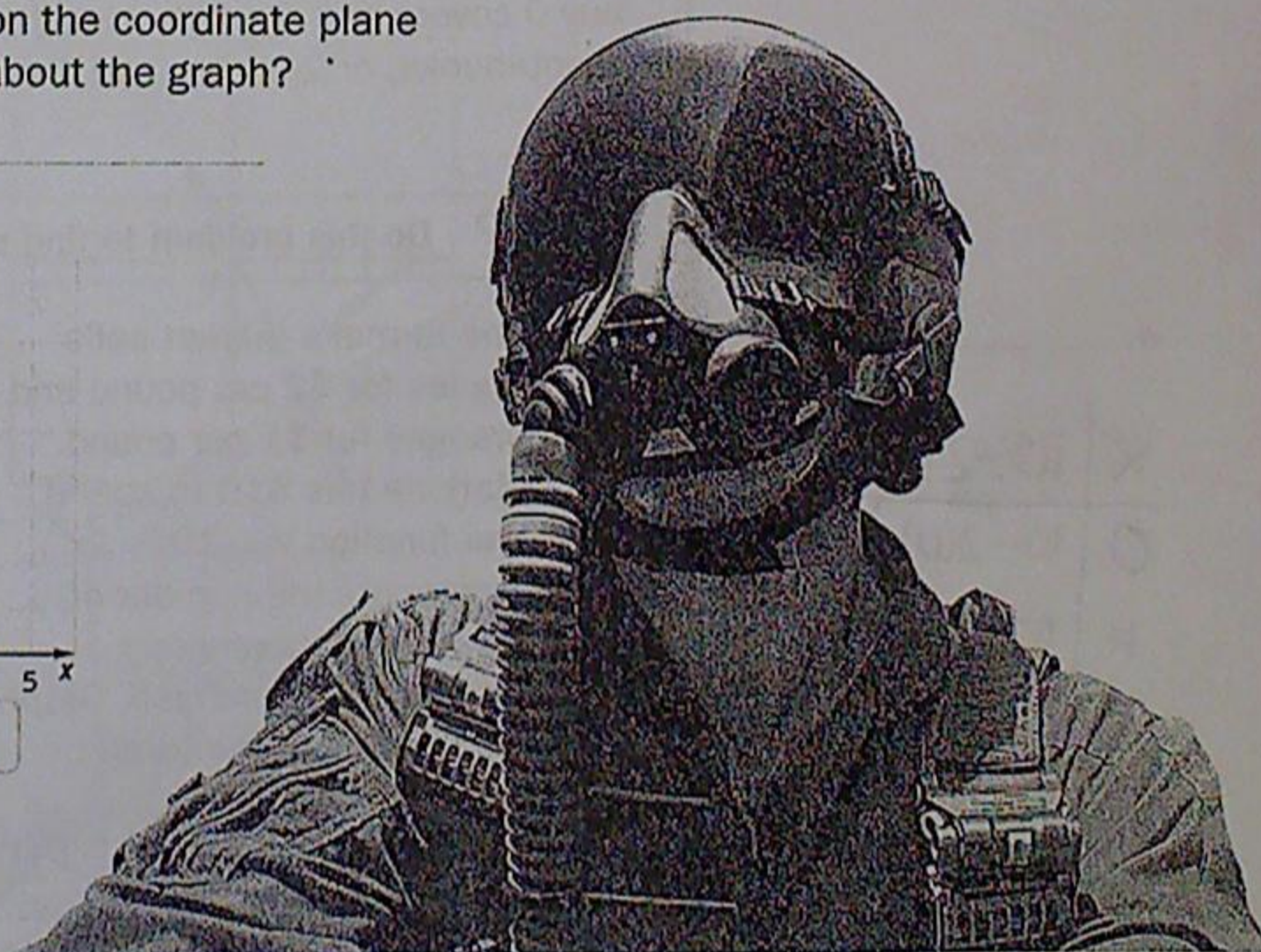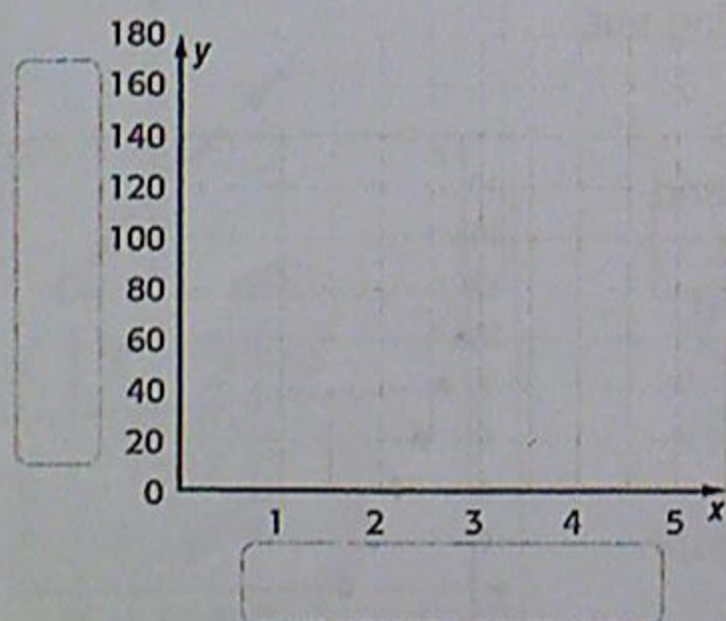
Graph a Function

Sometimes functions are written using two variables. One variable, usually x, represents the domain and the other, usually y, represents the range. When a function is written in this form it is an equation.

Like equations, functions can be represented in words, in a table, with a graph, and as ordered pairs. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

Function Notation

The equation $y = 5 - 3x$ can also be written in function notation as $f(x) = 5 - 3x$.

Real World Example

Tutor

1. The school store sells book covers for $2 each and notebooks for $1. Toni has $5 to spend. The function $y = 5 - 2x$ represents the number of book covers x and notebooks y she can buy. Graph the function. Interpret the points graphed.
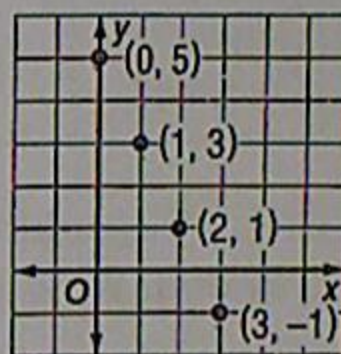
Step 1 Choose values for x and substitute them in the function to find y.

☆ Make a table of values!!

x	5 − 2x	y
0	5 − 2(0)	5
1	5 − 2(1)	3
2	5 − 2(2)	1
3	5 − 2(3)	−1

Step 2 Graph the ordered pairs (x, y).

She cannot buy negative amounts. So she can buy 0 covers and 5 notebooks, 1 cover and 3 notebooks, or 2 covers and 1 notebook.
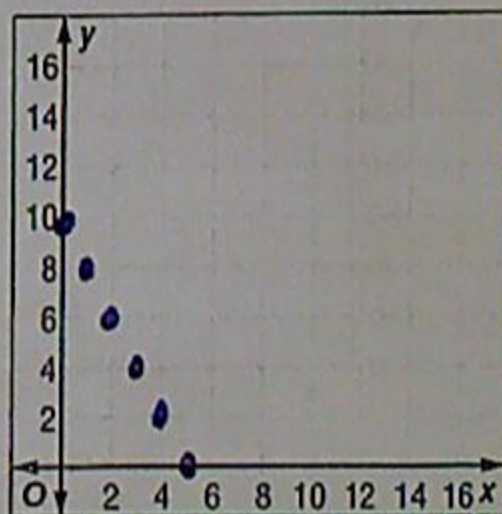

Got It? Do this problem to find out.

a. The farmer's market sells apples for $2 per pound and oranges for $1 per pound. Marjorie has $10 to spend. The function $y = 10 - 2x$ represents the number of apples x and oranges y Marjorie can purchase. Graph the function and interpret the points graphed.

a. _____

x	10−2x	y	
0	10−2(0)	10	(0,10)
1	10−2(1)	8	(1,8)
2	10−2(2)	6	(2,6)
3	10−2(3)	4	(3,4)
4	10−2(4)	2	(4,2)
5	10−2(5)	0	(5,0)

She can buy 0 apples and 10 oranges, 1 apple and 8 oranges, 2 apples and 6 oranges, etc. She can't buy negative amounts.