Topics: linear relationship, interpretation of the point-slope formula, and constructing a linear equation

Student Learning Outcomes:

1. Students will be able to apply the point-slope formula.

2. Students will be able to construct a linear equation from a written description.

1 Applying the Point-Slope Formula

The point-slope equation for the line through the point (x_1, y_1) with slope m is $y - y_1 = m(x - x_1)$.

1. Use the point-slope formula to find an equation of the line passing through the point $(2, -3)$ and having slope -4. Write your answer in slope-intercept form.

2. Use the point-slope formula to write an equation of the line passing through the points $(4, -6)$ and $(-1, 2)$. Write your answer in slope-intercept form.

2 Create Linear Functions to Model Data

In many day-to-day applications, two variables are related linearly. This means that any given any change in an independent variable, x, will always produce a corresponding change in the dependent variable, y. And when you plot this relationship on a graph, it traces a straight line.

3. A family plan for a cell phone has a monthly base price of $99 plus $12.99 for each additional family member added beyond the primary account holder.

    (a) Write a linear function to model the monthly cost $C(x)$, in dollars, of a family plan for x additional family members added.

    (b) Evaluate $C(4)$ and interpret the meaning in the context of this problem.

4. The data given in the table represent the age and systolic blood pressure for a sample of 12 randomly selected healthy adults.

Age in years	Pressure in mmHG
17	110
21	118
26	120
32	121
35	115
37	124
43	126
51	130
58	132
59	139
65	137
68	141

(a) Suppose x represents the age of an adult, in years, and y represents the systolic blood pressure, in mmHG. Use the points $(21, 118)$ and $(51, 130)$ to write a linear model relating y as a function of x.

(b) Interpret the meaning of the slope in the context of this problem.

(c) Use the model to estimate the systolic blood pressure for a 55 year old. Round to the nearest whole unit.

Student Learning Outcomes Check

1. Can you interpret the point-slope formula?

2. Are you able to construct a linear equation from a written description?

If any of your answers were no, please ask about these topics in class.