

Lesson 1: Identifying Linear Relations

Are You Ready? Possible Solutions

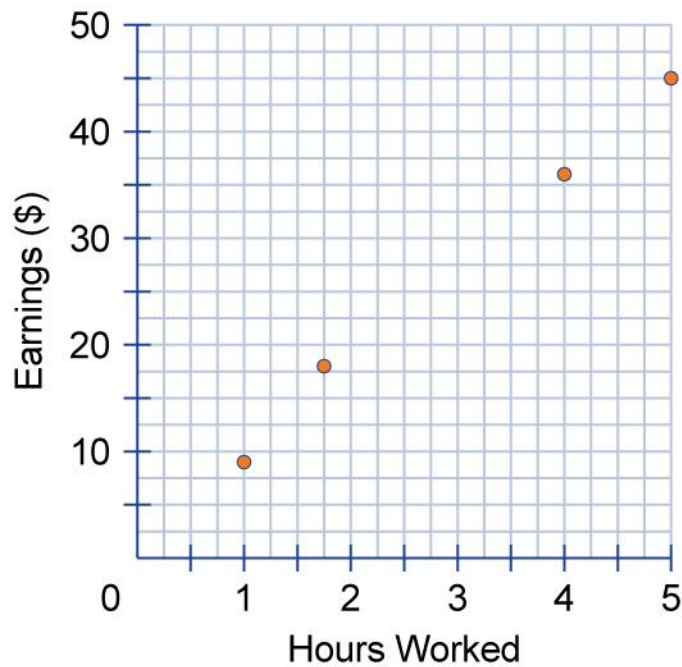
1. Relations are rules that associate input values to output values. Relations can be expressed in words and as ordered pairs, graphs, tables, arrow or mapping diagrams, and equations.

2. a.

Hours Worked	Earnings (\$)
1	9
2	18
4	36
5	45

b. (1, 9), (2, 18), (4, 36), (5, 45)

c. The student's graph should look similar to the following.



- d. No, it does not make sense to connect the points in the graph since the numbers in between do not have any meaning in this context. For example, employers may pay their employees based on every quarter-hour worked, but not down to the very specific minute. An employee who works 3 hours and 13 minutes will likely not be paid $3\frac{13}{60} \times \$9 / \text{hour} = \28.95 . Instead, the time may be rounded to 3 hours and 15 minutes, and the employee will be paid $3.25 \times \$9 / \text{hour} = \29.25 .

3. a. The rise between the two points is 4 units. The run between the two points is 12 units.

$$\begin{aligned}\frac{\text{rise}}{\text{run}} &= \frac{4}{12} \\ &= \frac{1}{3}\end{aligned}$$

Since the line falls to the right, the slope is negative. The slope is $-\frac{1}{3}$.

- b. Apply the slope formula to the coordinates of the points $(-8, 0)$ and $(4, -4)$.

$$\begin{aligned}m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{(-4) - 0}{4 - (-8)} \\ &= \frac{-4}{12} \\ &= -\frac{1}{3}\end{aligned}$$

4. The degree of a term is the sum of the exponents of the variables in the term. The degree of a polynomial is the same as the degree of the term with the highest degree.
5. a. 2
- b. 1
- c. 3