

Linear Equations and Inequalities



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Stephen collects coins. He begins with 25 coins and each week is sent 10 new coins in the mail. After w weeks he will have $25 + 10w$ coins. Let t stand for the total number of coins he has at the end of w weeks. The size of Stephen's collection over these weeks can be described in a number of ways. Three of them are shown here.

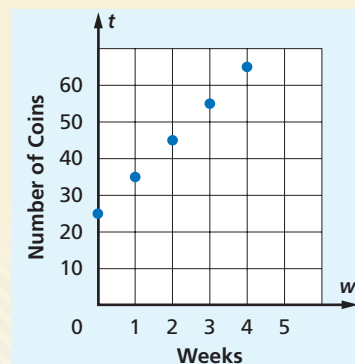
Equation

$$t = 25 + 10w$$

Table

w	t
0	25
1	35
2	45
3	55
4	65
⋮	⋮

Graph





The table lists the ordered pairs $(0, 25)$, $(1, 35)$, $(2, 45)$, $(3, 55)$, and $(4, 65)$. All these pairs make the equation $t = 25 + 10w$ true. The equation $t = 25 + 10w$ is called a *linear equation* because all the points of its graph lie on the same line. For the same reason, $25 + 10w$ is called a *linear expression*.

Linear equations are the backbone of relationships among variables. In Chapter 1 you connected points to make graphs of algebraic expressions. In this chapter and the next, you will see more of their many applications.