

Bellringer

1. State whether the relationship between x and y in $y=2x - 3$ is proportional or nonproportional. Then create a function table to represent it.

6.3 Comparing Functions

8.F.2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)

8.F.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Comparing a Table and an Equation

To compare, get the equation that is represented by the table

EXAMPLE 1

Josh and Maggie buy MP3 files from different music services. The monthly cost, y dollars, for x songs is linear. The cost of Josh's service is $y = 0.50x + 10$. The cost of Maggie's service is shown below.

Songs, x	5	10	15	20	25
Cost (\$), y	4.95	9.90	14.85	19.80	24.75

- A** Write an equation to represent the monthly cost of Maggie's service.

① Find slope = $m = \frac{\Delta y}{\Delta x} = \frac{4.95}{5} = \boxed{.99}$

② Find y -int = $4.95 = .99(5) + b$

$$\begin{aligned} 4.95 &= 4.95 + b \\ -4.95 &\quad -4.95 \\ \hline 0 &= b \end{aligned}$$

③ Write equation
 $y = .99x$

- B** Which service is cheaper when 30 songs are downloaded?

$$\begin{aligned} J: y &= .50x + 10 \\ &= .5(30) + 10 \\ &= 25.00 \end{aligned}$$

$$\begin{aligned} M: y &= .99x \\ &= .99(30) \\ &= 29.70 \end{aligned}$$

Josh's service is cheaper

ADDITIONAL EXAMPLE 1

Melanie and Patrick have different phone services. The relationship of the monthly cost, y dollars, to send or receive x text messages, is a linear function. The cost of Patrick's texting is described by $y = 0.03x + 5$. The cost of Melanie's texting is shown in the table.

Melanie's Monthly Texting Cost					
x	5	10	15	20	25
y	1.25	2.50	3.75	5.00	6.25

- A** Write an equation to represent Melanie's monthly texting cost.

$$m = \frac{\Delta y}{\Delta x} = \frac{1.25}{5} = .25$$

$$b = 1.25 = .25(5) + b$$

$$\begin{array}{r} 1.25 = 1.25 + b \\ -1.25 \quad -1.25 \\ \hline 0 = b \end{array}$$

$$y = .25x$$

- B** Which service is cheaper when 50 texts are sent or received in one month?

$$\star P: y = .03(50) + 5$$

$$= 6.50$$

$$M: y = .25(50)$$

$$= 12.50$$

YOUR TURN

1. Quentin is choosing between buying books at the bookstore or buying online versions of the books for his tablet. The cost, y dollars, of ordering books online for x books is $y = 6.95x + 1.50$. The cost of buying the books at the bookstore is shown in the table. Which method of buying books is more expensive if Quentin wants to buy 6 books?

Cost of Books at the Bookstore						
Books, x	1	2	3	4	5	6
Cost (\$), y	7.50	15.00	22.50	30.00	37.50	45.00

+7.50

$$B: \$45.00$$

$$O: y = 6.95(6) + 1.50 \\ = \$43.20$$

Bookstore

EXPLORE ACTIVITY 1

EXPLORE ACTIVITY 2

Guided Practice

Doctors have two methods of calculating maximum heart rate. With the first method, maximum heart rate, y , in beats per minute is $y = 220 - x$, where x is the person's age. Maximum heart rate with the second method is shown in the table. (Example 1)

Age, x	20	30	40	50	60
Heart rate (bpm), y	194	187	180	173	166

1. Which method gives the greater maximum heart rate for a 70-year-old?
2. Are heart rate and age proportional or nonproportional for each method?

