Name _____ Class _____ Date _____

2-6

Comparing Functions

COMMON CORE

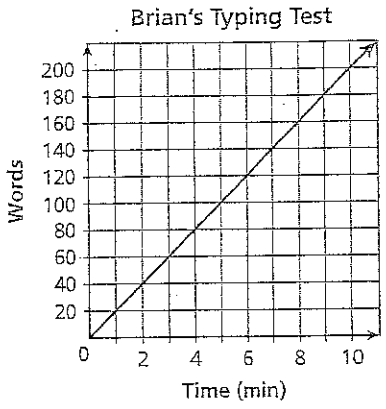
CC.8.EE.5
CC.8.F.2
CC.8.F.4

Essential question: *How can you use tables, graphs, and equations to compare functions?*

1 EXPLORE Comparing a Table and a Graph

The table and graph show how many words Morgan and Brian typed correctly on a typing test. For both students, the relationship between words typed correctly and time is linear.

Morgan's Typing Test					
Time (min)	2	4	6	8	10
Words	30	60	90	120	150



A Find Morgan's unit rate.

_____

B Find Brian's unit rate.

_____

C Which student types more correct words per minute?

_____

REFLECT

1a. Sketch a graph of Morgan's test results on the same coordinate grid as Brian's results. How are the graphs similar? How are they different?

_____

_____

1b. Katie types 17 correct words per minute. Explain how a graph of Katie's test results would compare to Morgan's and Brian's.

_____

_____

1c. The equation that describes Jen's test results is $y = 24x$. Explain how a graph of Jen's test results would compare to Morgan's and Brian's.

_____

_____

2 EXPLORE Comparing a Table and an Equation

Josh and Maggie buy MP3 files from different music download services. With both services, the monthly charge is a linear function of the number of songs downloaded. The cost at Josh's service is described by $y = 0.50x + 10$ where y is the cost in dollars and x is the number of songs downloaded.

Cost of MP3s at Maggie's Music Service					
Songs, x	5	10	15	20	25
Cost ($), y	4.95	9.90	14.85	19.80	24.75

A Find the unit rate of each function.

Josh: _____ Maggie: _____

B Which function has the greater rate of change? What does that mean in this context?

_____

C Write an equation in slope-intercept form to describe the cost at Maggie's music service.

$y = mx + b$

$= \quad \cdot \quad + b$ *Substitute for y, m, and b.*

$= \quad + b$ *Subtract the number that is added to b from both sides.*

$- \quad - \quad$

$= \quad b$

$y = \quad x +$

D Describe each service's cost in words using the meanings of the slopes and y-intercepts.

_____

_____

REFLECT

2a. How much does it cost at each service to download 20 songs?

_____

2b. You are trying to choose between these two music services. How could you decide which service is better for you?

_____

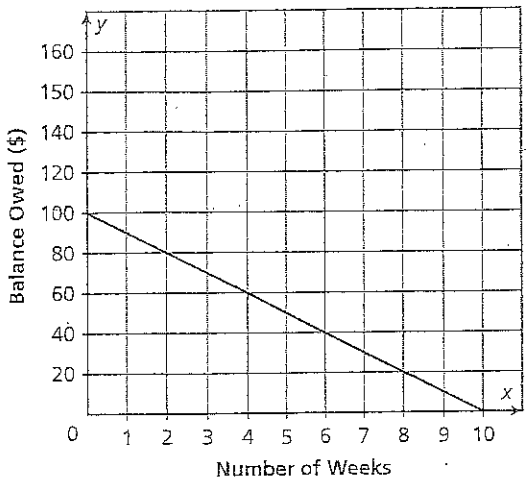
_____

3 EXPLORE Comparing a Graph and a Description

Jamal wants to buy a new game system that costs $200. He only has $100 today, so he compares layaway plans at different stores.

The plan at Store A is shown on the graph.

Store B requires an initial payment of $60 and weekly payments of $20 until the balance is paid in full.



A

A Use the graph of the layaway plan at Store to write an equation in slope-intercept form. Let x represent number of weeks and y represent balance owed.

B Use the description of the layaway plan at Store B to write an equation in slope-intercept form. Let x represent number of weeks and y represent balance owed.

C Sketch a graph of the plan at Store B on the same grid as Store A.

D How can you use the graphs to tell which plan requires the greater down payment? How can you use the equations?

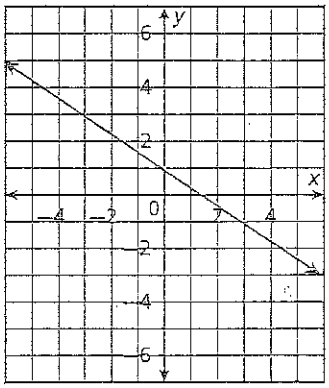
E How can you use the graphs to tell which plan requires the greater weekly payment? How can you use the equations?

F Which plan allows Jamal to pay for the game system faster? Explain.

PRACTICE

The table and the graph display two different linear functions.

Input, x	Output, y
−3	5
−1	1
2	−5
3	−7
6	−13



1. Find the slope of each function.

Table: _____ Graph: _____

2. Without graphing the function represented in the table, tell which function's graph is steeper.

_____

_____

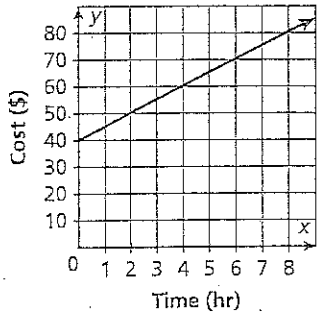
3. Write an equation for each function.

Table: _____ Graph: _____

4. Use the equations from **3** to tell which function has the greater y-intercept.

_____

Aisha runs a tutoring business. Students may choose to pay $15 per hour or they may follow the plan shown on the graph.



5. Describe the plan shown on the graph.

_____

6. Sketch a graph showing the $15 per hour option.

7. What does the intersection of the two graphs mean?

_____

8. If you wanted to hire Aisha for tutoring, how can you decide which payment option is better for you?

_____

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