ALBERT

Name _____ Date _____

Comparing Functions Worksheet

Grade 8 · Common Core 8.F.A.2

> Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

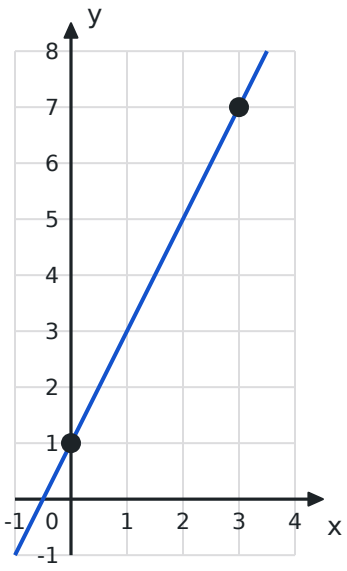
Practice

Builds the skill step by step.

1. The table shows a linear function. What is its rate of change?

x	1	2	3	4
y	3	7	11	15

2. The graph shows a linear function. What is its rate of change?



3. What is the initial value of the function $y = -2x + 9$?

4. Function A is $y = 6x + 1$. Function B is shown in the table. Which function has the greater rate of change?

x	0	1	2
y	3	8	13

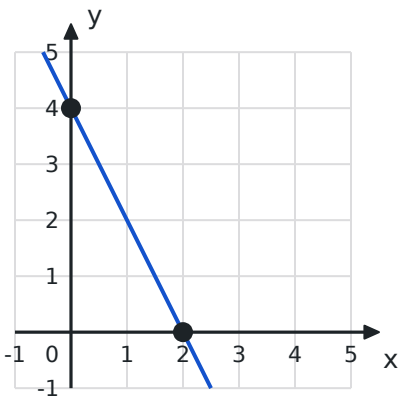
A. Function A

B. Function B

C. They are equal

D. There is not enough information

5. Function A is shown on the graph. Function B is $y = x + 1$. Which function has the greater initial value? Answer Function A or Function B.



6. Function A starts at 10 and increases by 3 each time x increases by 1. Function B is y = 4x + 12. Which function has the greater rate of change?

   A. Function A

   B. Function B

   C. They are equal

   D. There is not enough information

7. Plan A costs y = 20x dollars for x months. Plan B's costs are in the table. How many more dollars per month does Plan B cost?

Months	1	2	3
Cost (dollars)	25	50	75

8. Function A is y = 4x and Function B is y = 4x − 3. Which function has the greater output when x = 2? Answer Function A or Function B.

9. The graph of Function A is a line through (0, 0) and (1, 3). Function B is y = 3x + 5. Which statement is true?

   A. They have the same rate of change.

   B. Function A has the greater rate of change.

   C. Function B has the greater rate of change.

   D. They have the same initial value.

10. A candle is 12 inches tall when it is lit. It burns down 1.5 inches each hour. What is the initial value of the function that gives the candle's height?

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On Level

Grade-level practice.

1. Car A travels d = 55t miles in t hours. Car B's trip is in the table. Which car is faster, and by how much?

Hours	2	4	6
Miles	104	208	312

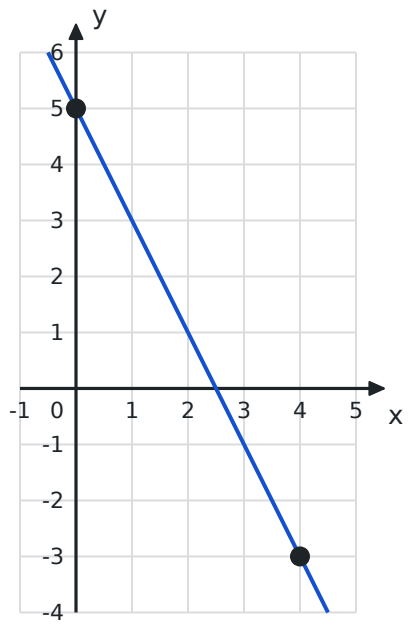
A. Car B, by 3 miles per hour

B. Car B, by 52 miles per hour

C. Car A, by 3 miles per hour

D. Car A, by 49 miles per hour

2. Function A is $y = -2x + 8$. Function B is shown on the graph. Which statement is true?



A. They have the same rate of change.

B. They have the same initial value.

C. Function B has the greater rate of change.

D. Function B has the greater initial value.

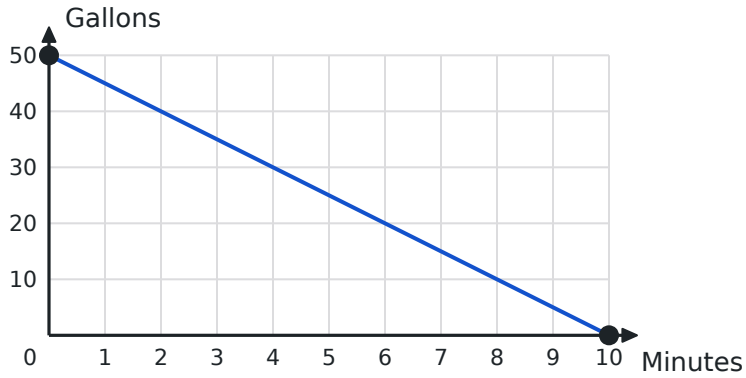
3. Gym A charges a 30-dollar joining fee plus 15 dollars per month. Gym B's total costs are in the table. After how many months have the two gyms cost the same total?

Months	1	2	3	4
Total cost (dollars)	40	60	80	100

4. Function A's graph crosses the y-axis at −3 and rises 2 units for every 1 unit to the right. Function B is shown in the table. Which function has the greater initial value? Answer Function A or Function B.

x	1	2	3
y	1	4	7

5. The graph shows the water left in Tank A as it drains. Tank B drains so that w = 80 − 6t gallons remain after t minutes. Which tank drains faster?



A. Tank B, at 80 gallons per minute

B. Tank B, at 6 gallons per minute

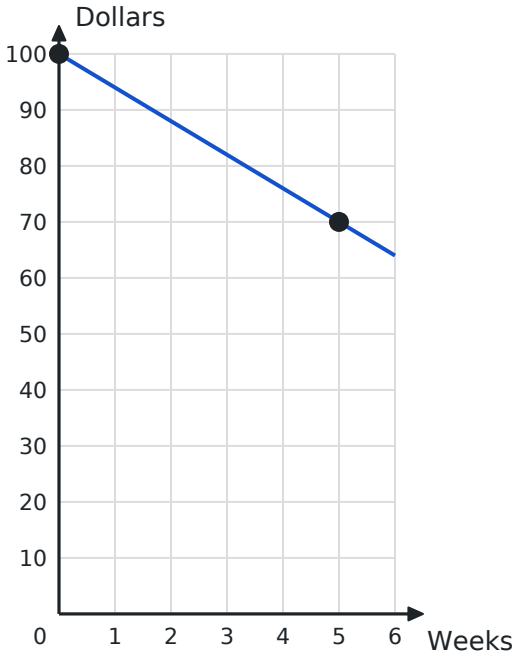
C. Tank A, at 10 gallons per minute

D. Tank A, at 5 gallons per minute

6. Function A is y = 0.5x + 3. Function B is shown in the table. When x = 6, how much greater is Function B's output than Function A's?

x	−2	0	2
y	1	3	5

7. Ava starts with 40 dollars and saves 12 dollars each week. The graph shows Ben's balance as he spends from his account. Whose balance changes faster, and by how much per week?



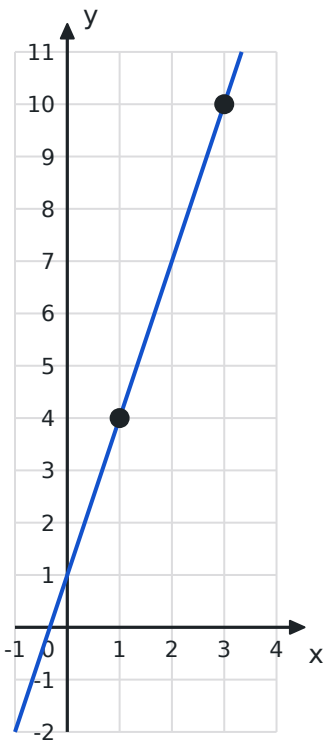
A. Ben's, by 30 dollars per week

B. Ava's, by 18 dollars per week

C. Ben's, by 6 dollars per week

D. Ava's, by 6 dollars per week

8. Function A is $y = 3x - 1$. Function B is shown on the graph. For every input, Function B's output is greater. By how much?



9. Plan A costs $y = 0.10x + 15$ dollars for x texts. Plan B's costs are in the table. Which plan costs less for 150 texts? Answer Plan A or Plan B.

Texts	0	100	200
Cost (dollars)	10	25	40

10. Function A is shown in the table. Function B is $y = 0.4x + 2$. Which statement is true?

x	0	1	2	3
y	2	2.5	3	3.5

A. They have the same initial value, and B has the greater rate of change.

B. They have the same rate of change, and A has the greater initial value.

C. They have the same initial value, and A has the greater rate of change.

D. They have different initial values and different rates of change.

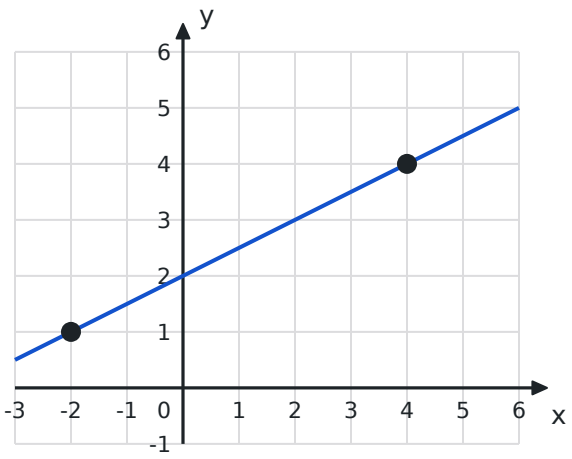
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Challenge

Multi-step and word problems that stretch it.

1. Function A is shown on the graph. Function B is y = 0.75x + 1. For which inputs is Function B's output greater than Function A's? Write an inequality.



2. Function A is linear and passes through (2, 7) and (6, 19). Function B's graph rises 4 units for every 2 units to the right and crosses the y-axis at 5. When x = 10, which function has the greater output, and by how much?

3. Function A is y = 2x + 7. Function B is in the table. Rae says Function B's rate of change is 6, so Function B is steeper. What is the error?

x	0	2	4
y	1	7	13

   A. There is no error. B's rate of change is 6.

   B. She should have compared initial values, so Function A is steeper.

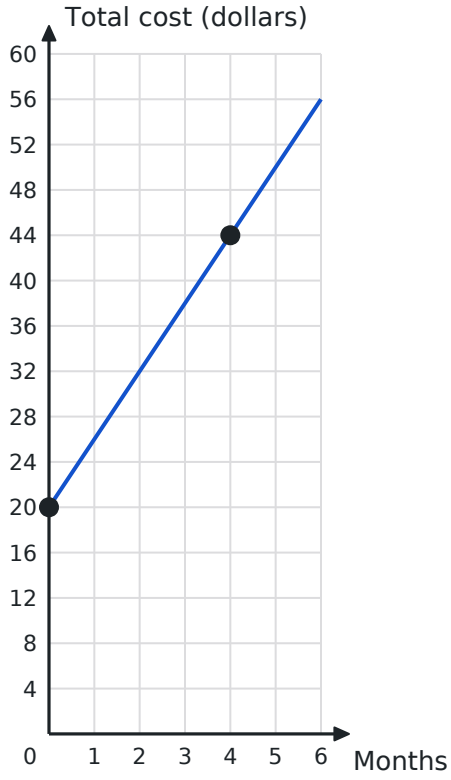
   C. B's rate of change is 2, the same as A's.

   D. She did not divide by the change in x. B's rate is 3, which is still greater than 2.

4. Function A is y = mx + 3. Function B is in the table. What value of m makes the two functions have the same output when x = 2?

x	0	1	2
y	−1	4	9

5. Streaming Plan A costs 8 dollars per month with no sign-up fee. The graph shows the total cost of Plan B. Which plan costs less for 12 months, and by how much?



6. Function A is in the table. Function B is $y = -1.5x + 12$. Which function has the greater rate of change?

x	1	3	5
y	10	6	2

A. Function A

B. Function B

C. They are equal

D. There is not enough information

7. Function A is $y = -3x + 20$. Function B is linear and passes through (0, 2) and (3, 11). At what point do the two functions have the same input and output? Write it as an ordered pair.

8. One linear function is given as a table and another as an equation in the form $y = mx + b$. Explain how to find each rate of change so you can compare them.

9. Function A is in the table. Function B starts at 9 and increases by 2.5 each time x increases by 1. How much greater is Function A's rate of change than Function B's?

x	2	4	6
y	11	17	23

10. Function A is shown on the graph. Function B is $y = -x + 5$. Which function has the greater initial value, and by how much?

