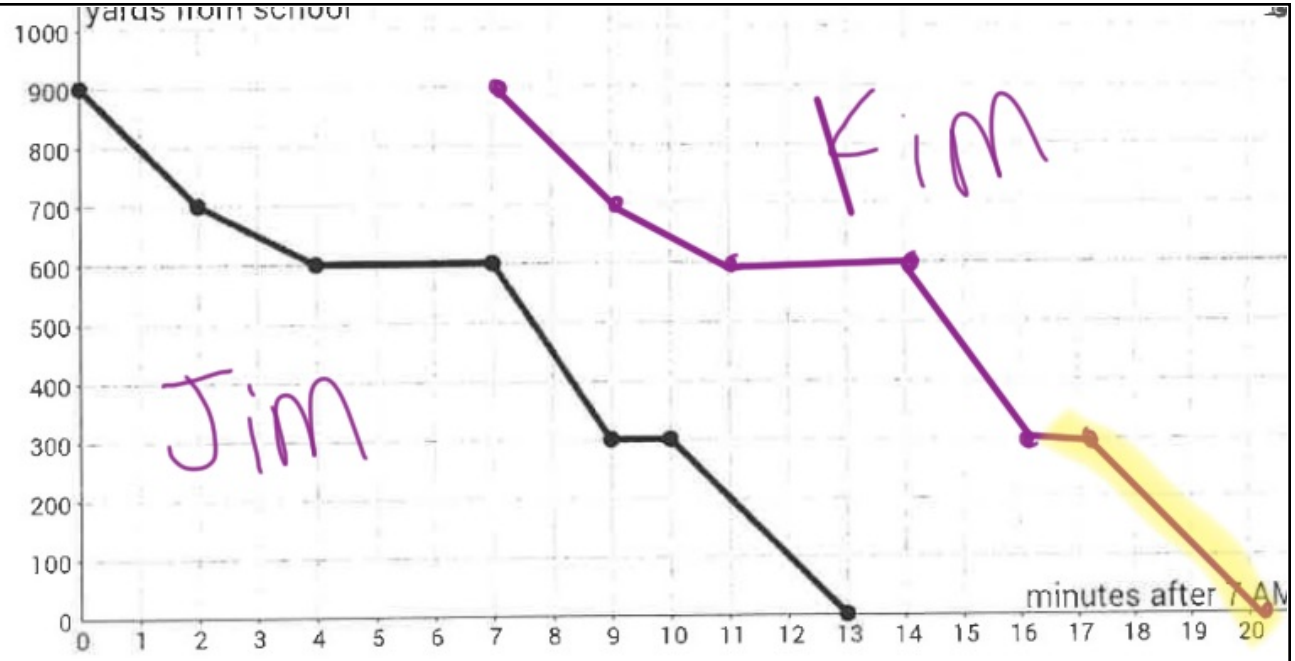
Unit 1

Lesson 7

Interpreting Functions / Domain & Range

Kim and Jim are twins and live at the same home. They each walk to school along the same path at exactly the same speed. However, Jim likes to arrive at school early and Kim is happy to arrive 7 minutes later, just as the bell rings. Pictured at right is a graph of Jim's distance from school over time.



1. Use a dotted line to sketch Kim's graph of distance from school over time (once she leaves for school).
2. How many minutes after 7AM does Jim leave for school? 0 +7
3. How many minutes after 7AM does Jim arrive at school? 13 +7
4. How many minutes after 7AM does Kim leave for school? 7
5. How many minutes after 7AM does Kim arrive at school? 20

6. What is Jim's farthest distance from school? 900 yds
7. What is Jim's closest distance to school? 0 yds
8. What is Kim's farthest distance from school? 900 yds
9. What is Kim's closest distance to school? 0 yds

S B
[7, 20]

➢ **Use your answers to the above questions to fill in the following:**

X values

10. Jim's domain: 0 $\leq x \leq$ 13 [0, 13]
(where x represents time after 7AM)

11. Kim's domain: _____ $\leq x \leq$ _____
(where x represents time after 7AM)

y values

12. Jim's range: 0 $\leq y \leq$ 900
(where y represents distance from school)
[0, 900]

13. Kim's range: _____ $\leq y \leq$ _____ [0, 900]
(where y represents distance from school)
S B

➢ Inequalities can also be written in **interval notation**. Parentheses and/or brackets are used to show whether the endpoints are excluded or included. For example, [3, 8) is the **interval** of real numbers between 3 and 8, **including** 3 and **excluding** 8. Another example, [4, ∞) is the interval of real numbers greater than or equal to 4.

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➢ Quick review: The **domain** is the set of all possible $x - values$ on the graph. The **range** is the set of all possible $y - values$ on the graph.

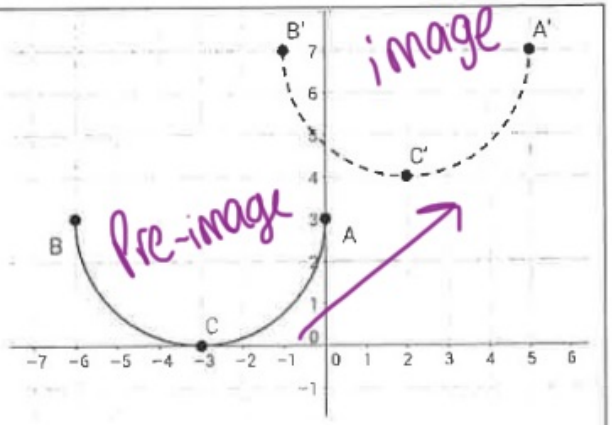
1. **Describe the translation(s) from the pre-image to the image.**

   a. Given the following graph, state the domain and range of the pre-image in ~~inequality~~ interval notation:

   Domain: [-6, 0] Range: [0, 3].

   b. State the domain and range of the image in **interval** notation:

   Domain: [-1, 5] Range: [4, 7].



2. **Draw and label the image of $\overline{AB}$ translated left 2 and down 3.**

   a. State the domain and range of the pre-image:

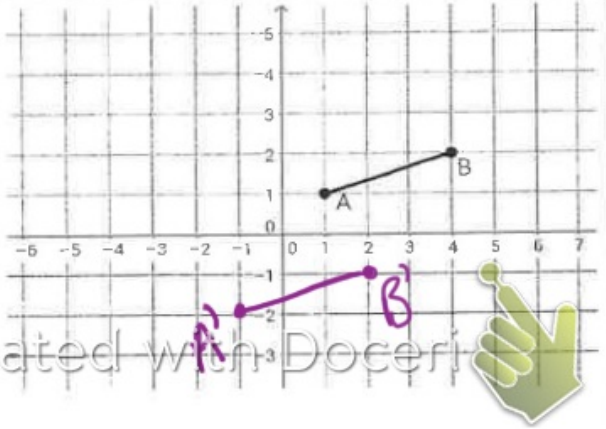
   Domain: [1, 4] Range: [1, 2].

   Domain: Range:

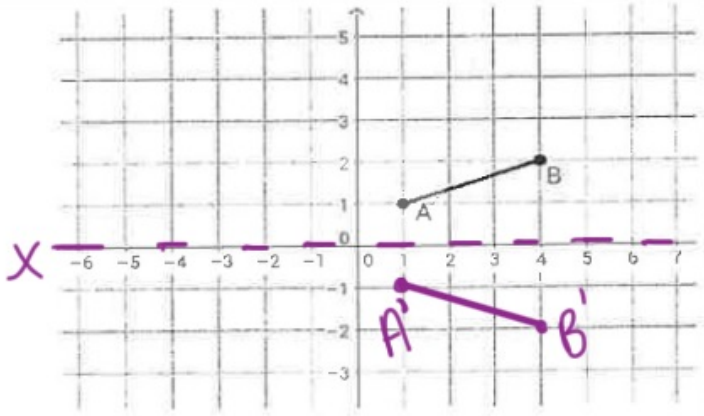
   b. State the domain and range of the image:

   Domain: [-1, 2] Range: [-2, -1].

   Domain: Range:



3. **Draw and label the image of $\overline{AB}$ reflected over the x-axis.**



a. State the domain and range of the pre-image:

Domain: [1,4] Range: [1,2].

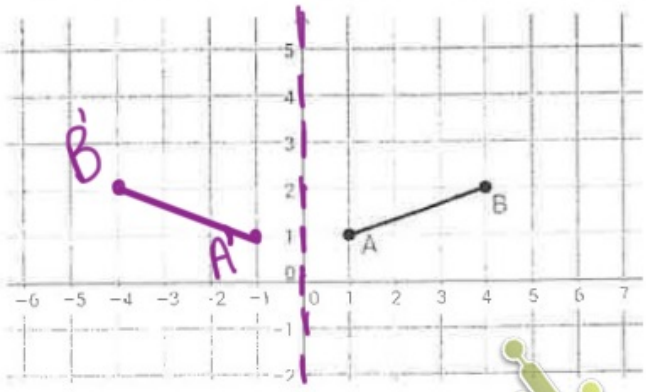
~~Domain:~~ _____ ~~Range:~~ _____.

b. State the domain and range of the image:

Domain: [1,4] Range: [-2,-1].

~~Domain:~~ _____ ~~Range:~~ _____.

4. **Draw and label the image of $\overline{AB}$ reflected over the y-axis.**



a. State the domain and range of the pre-image:

Domain: [1 4] Range: [1,2].

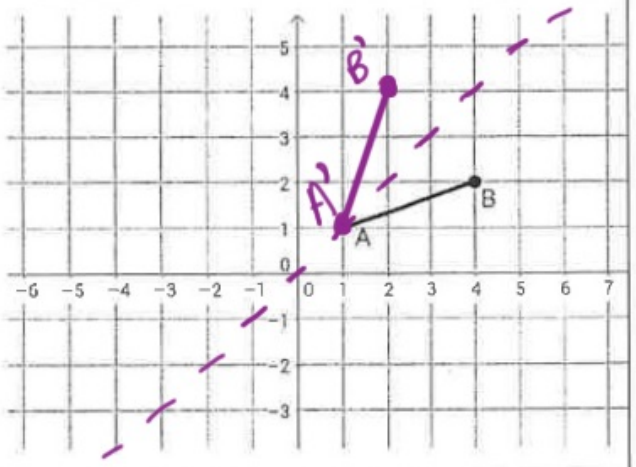
~~Domain:~~ _____ ~~Range:~~ _____.

b. State the domain and range of the image:

Domain: [-4,-1] Range: [1,2].

~~Domain:~~ _____ ~~Range:~~ _____.

5. **Draw and label the image of $\overline{AB}$ reflected over the line $y = x$.**



a. State the domain and range of the pre-image:

Domain: [1 4] Range: [1,2].

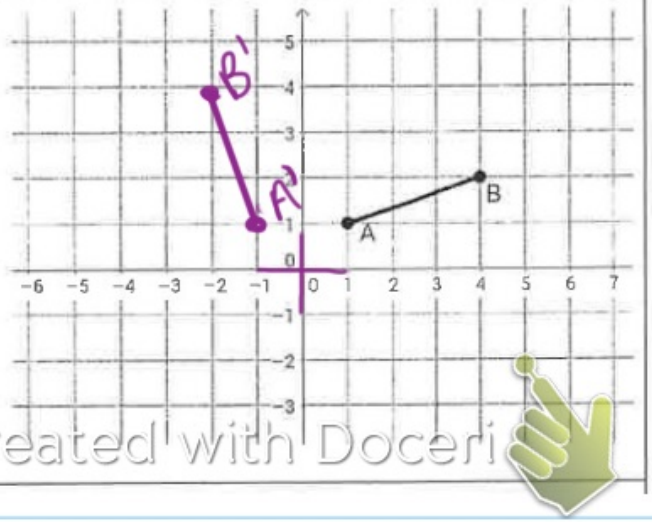
Domain: Range:

b. State the domain and range of the image:

Domain: [1,3] Range: [1,4].

Domain: Range:

6. **Draw and label the image of $\overline{AB}$ rotated 90°.** (CCW)



a. State the domain and range of the pre-image:

Domain: [1 4] Range: [1,2].

Domain: Range:

b. State the domain and range of the image:

Domain: [-2,-1] Range: [1,4].

Domain: Range:

7. Draw and label the image of $\overline{AB}$ dilated by a scale factor of 3.

a. State the domain and range of the pre-image:

Domain: [1 4] Range: [1,2].

Domain: _____ Range: _____.

b. State the domain and range of the image:

Domain: [3,12] Range: [3,6].

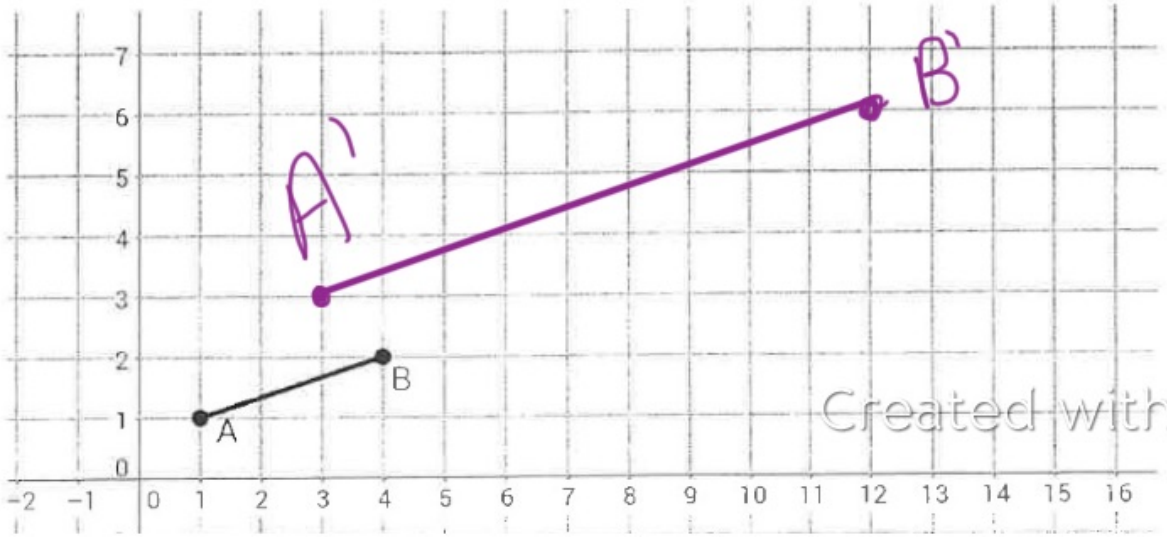
Domain: _____ Range: _____.

A(1,1)

A'(3,3)
x y

B(4,2)

B''(12,6)
x y



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