Lesson 9: Increasing and Decreasing Functions

- Let's look at what a graph does based on a situation.

9.1: Comparing Values

For each pair of numbers, write $=$, $<$, or $>$ in the blank to make a true equation or inequality. Be prepared to share your reasoning.

1. -6 _____ -9

2. $\frac{7}{3}$ _____ $\frac{13}{6}$

3. 5.2 _____ $\frac{53}{11}$

4. $5(3-6)$ _____ $15-6$

5. Let $f(x) = 5 - 2x$.
   a. $f(3)$ _____ $f(5)$

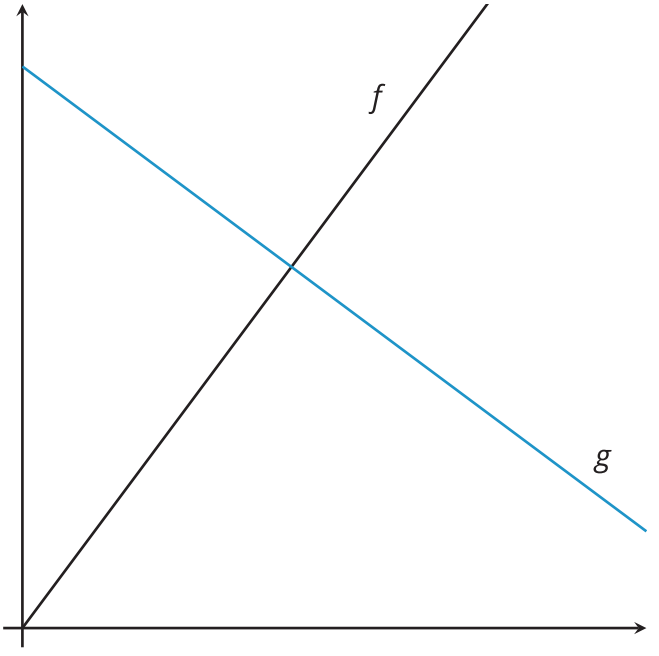
   b. $f(\text{-}3)$ _____ $f(\text{-}4)$

   c. $f(\text{-}1)$ _____ $f(1)$

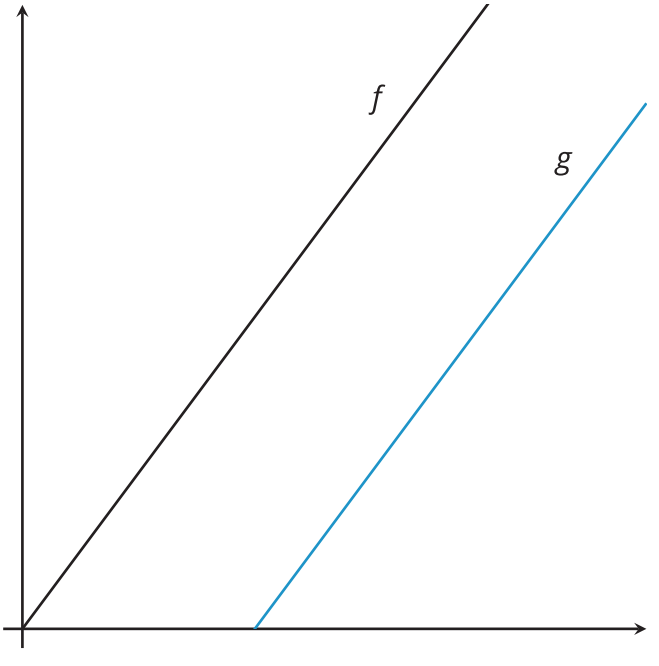
9.2: What Could It Be?

Describe $f(x)$ and $g(x)$ with a situation that could fit the given graphs. Explain your reasoning.

1.



2.



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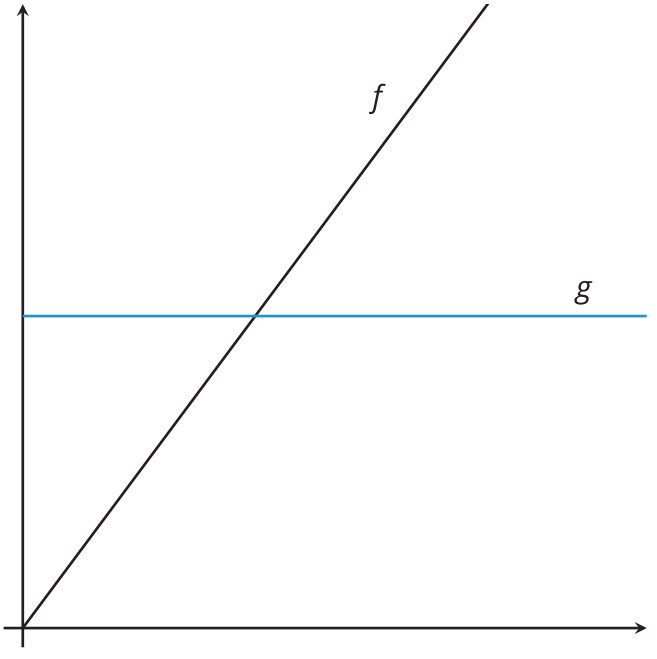
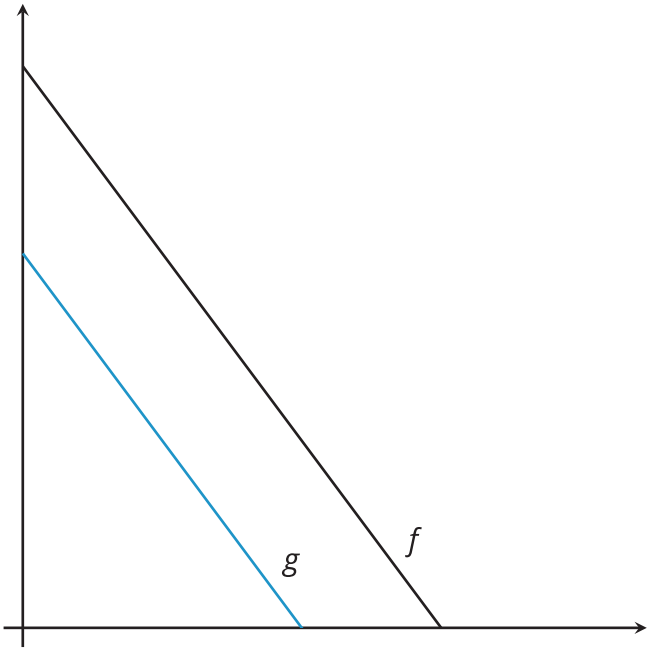


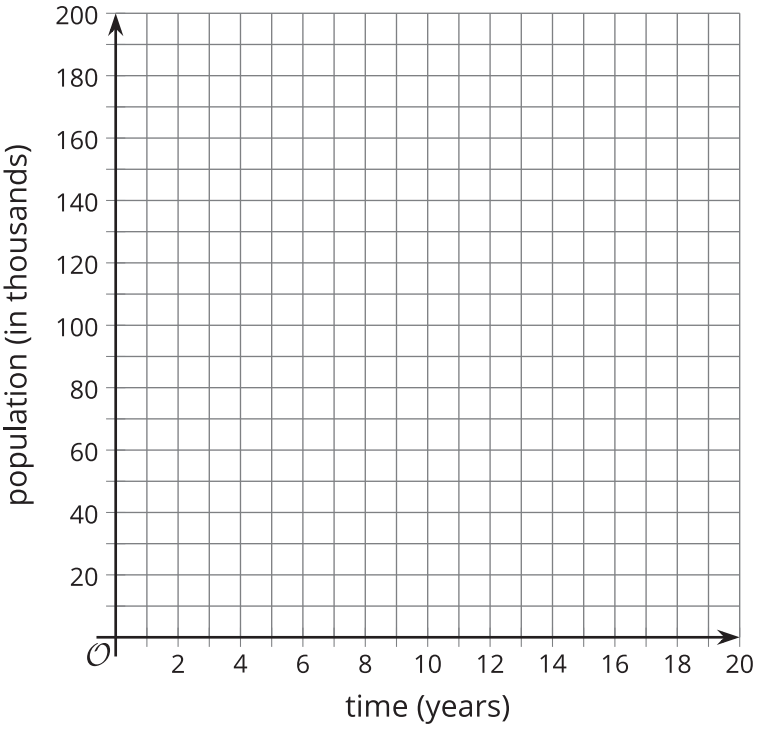
4.



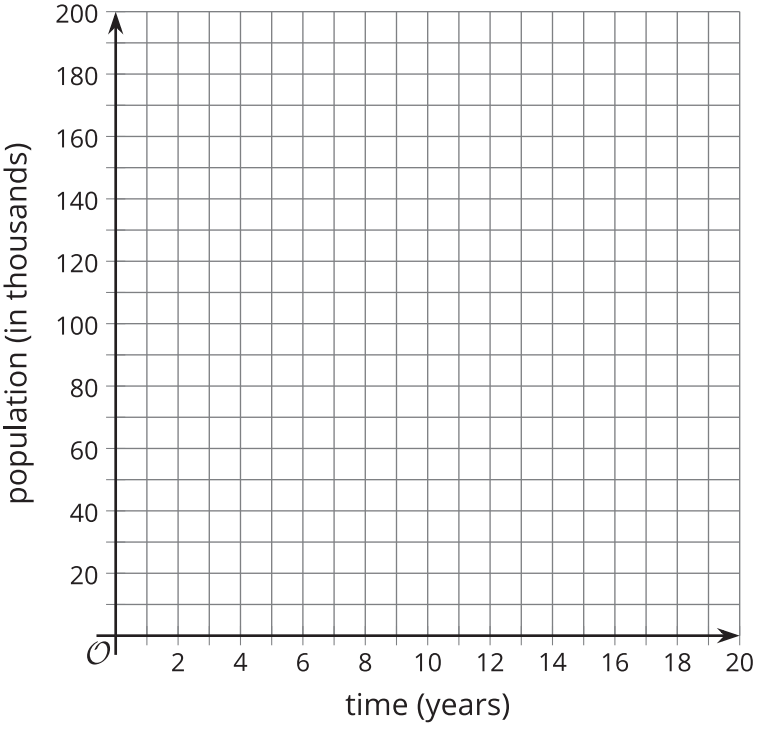
9.3: Cities, Towns, and Villages

Draw an example of a graph that shows two functions as they are described. Make sure to label the functions.

1. The population of 2 cities as functions of time so that city A always has more people than city B.



2. The population of 2 towns as functions of time so that town A is larger to start, but then town B gets larger.



3. The population of 2 villages as functions of time so that village A has a steady population and village B has a population that is initially large, but decreases.