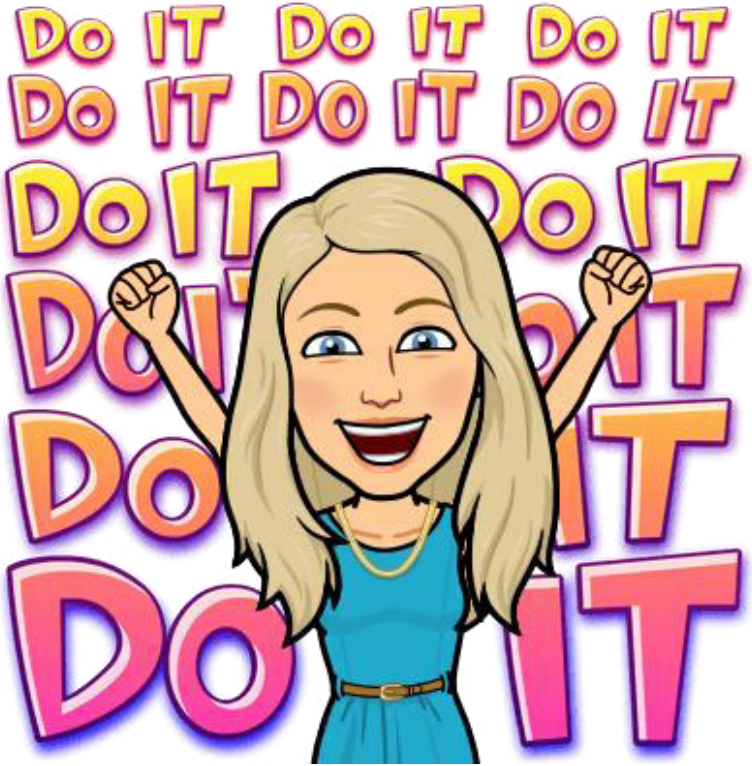
Today's materials



Comparing graphs

Lesson 9

Comparing Graphs

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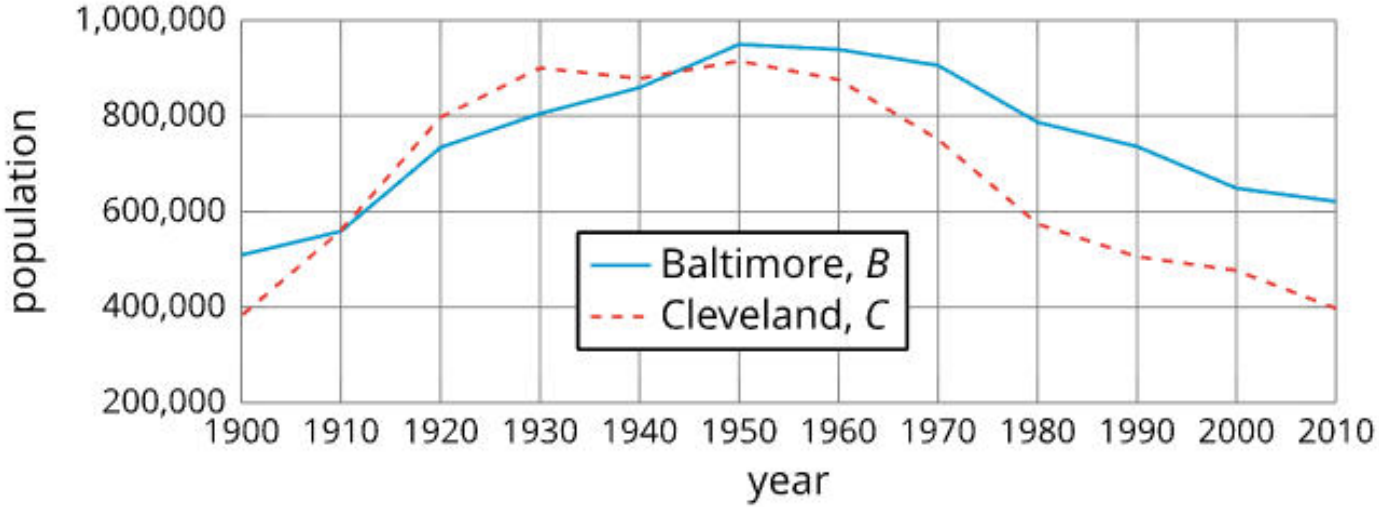
9.1 Warm Up (5 minutes)

9.1: Population Growth

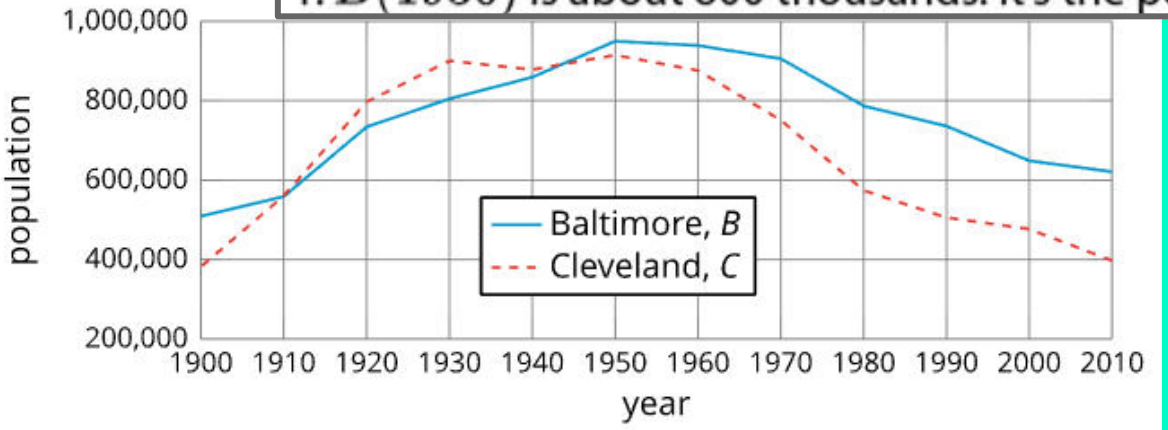
This graph shows the populations of Baltimore and Cleveland in the 20th century. $B(t)$ is the population of Baltimore in year t. $C(t)$ is the population of Cleveland in year t.



Write all responses in your packet.

How'd it go?

1. $B(1930)$ is about 800 thousands. It's the population of Baltimore in 1930.



1. Estimate $B(1930)$ and explain what it means in this situation.
2. Here are pairs of statements about the two populations. In each pair, which statement is true? Be prepared to explain how you know.

   a. $B(2000) > C(2000)$ or $B(2000) < C(2000)$
   b. $B(1900) = C(1900)$ or $B(1900) > C(1900)$
3. Were the two cities' populations ever the same? If so, when?

2. a. $B(2000) > C(2000)$
   b. $B(1900) > C(1900)$
3. Yes. The populations were the same in roughly 1910 and 1943.

Let’s compare graphs of functions to learn about the situations they represent.

Today's Goals:

- ❑ I can compare the features of graphs of functions and explain what they mean in the situations represented.
- ❑ I can make sense of an equation of the form $f(x)=g(x)$ in terms of a situation and a graph, and know how to find the solutions.
- ❑ I can make sense of statements about two or more functions when they are written in function notation.

Wired or wireless?

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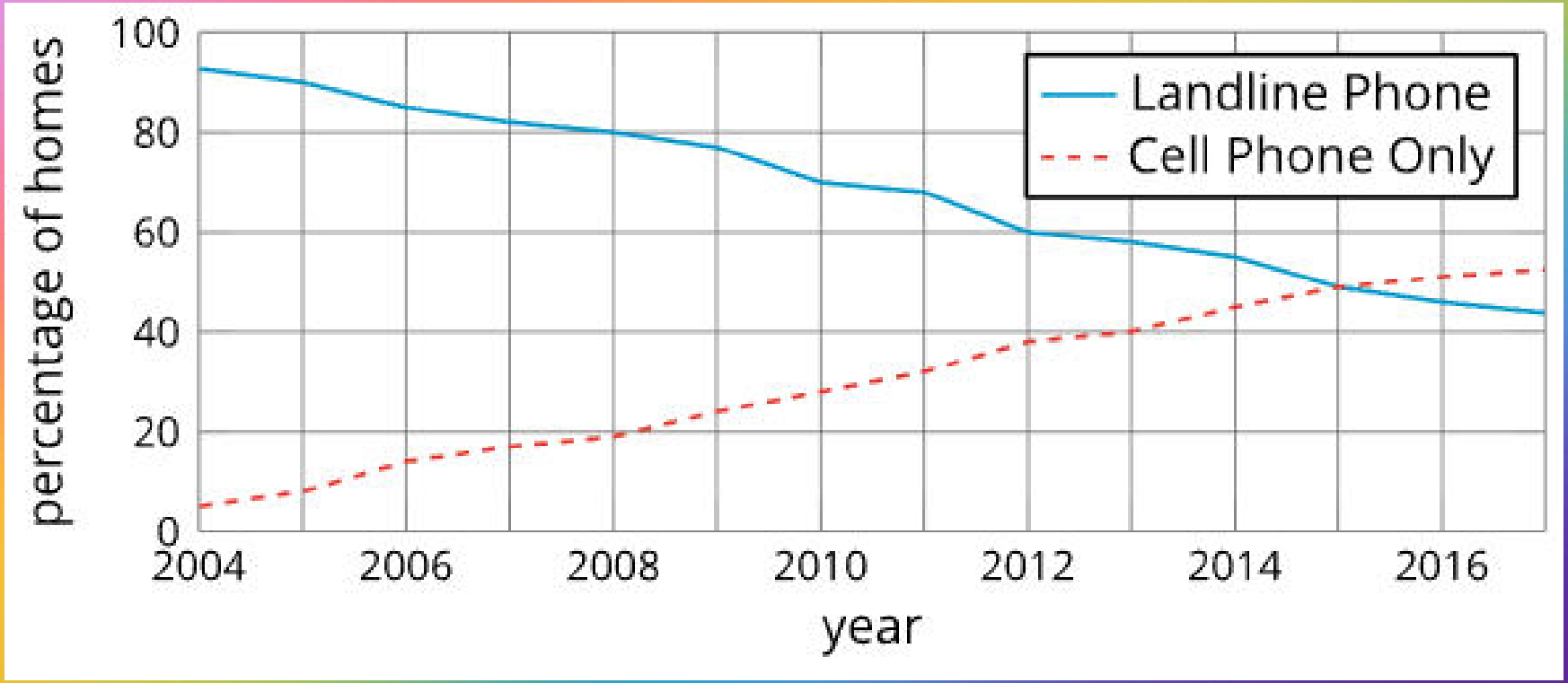
9.2 Activity (20 minutes)

Landline: the OG phone

What do you notice?



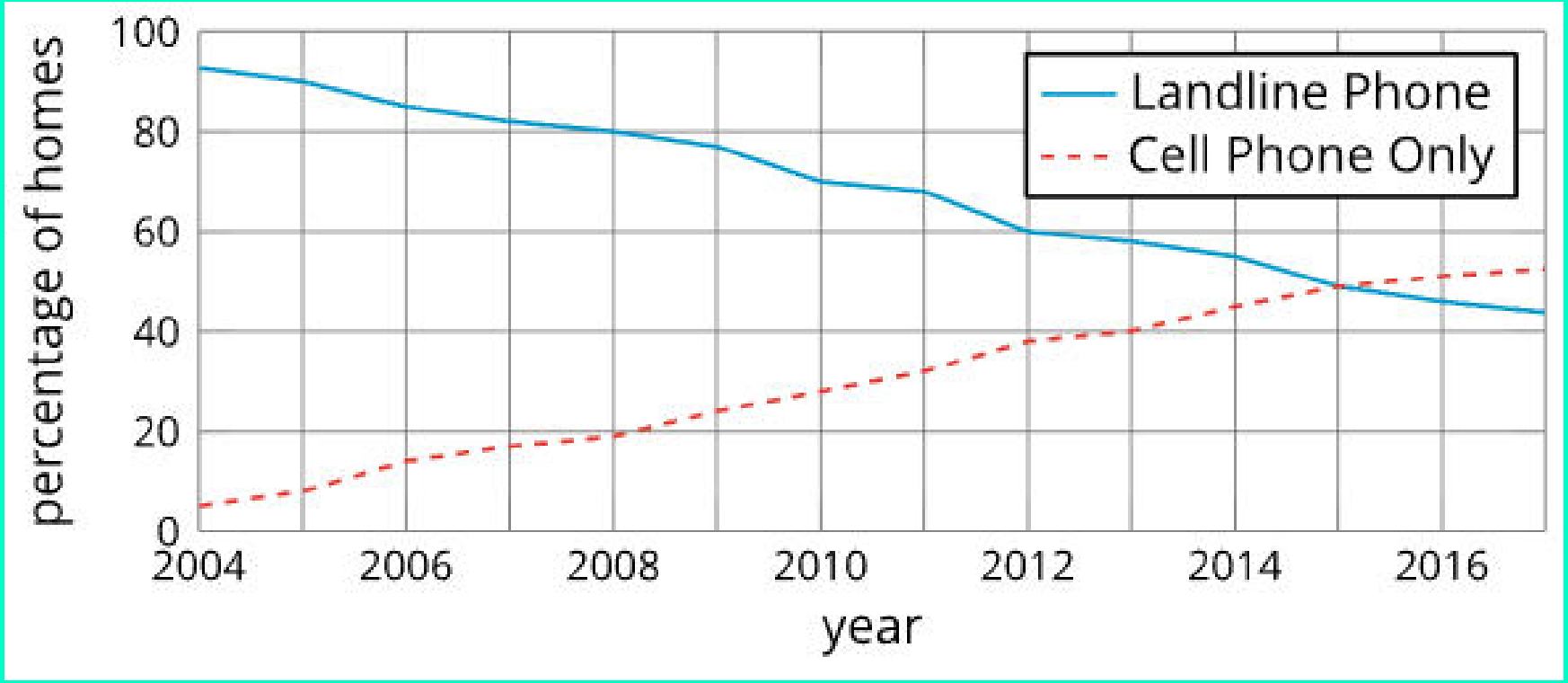
On the whiteboards….
Use the graph to Complete #1,2,3 & 4

How’d it go?

1. H(2006) is about 85, C(2006) is about 14
   In 2006, 85% of homes had a landline. In 2006, 14% of homes had a cell phone only.
1. ~2008
2. Around 2008, 20% of homes had a cell phone only.
3. No → different percentages for each function
   Yes → same percentage for both function
1. The rate of changes seems similar from 2004 to 2015.
   One is increasing and the other is decreasing.

Synthesis

$$C(2015) = H(2015)$$



Audience of TV shows (optional)

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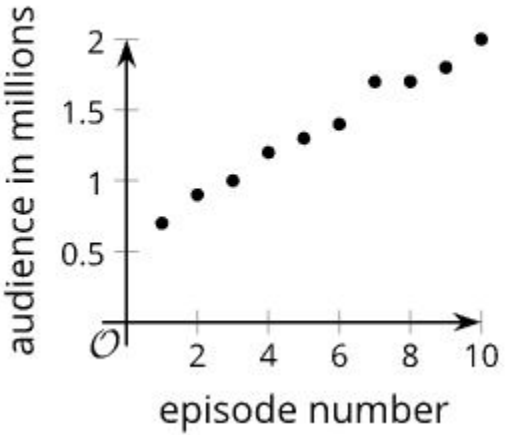
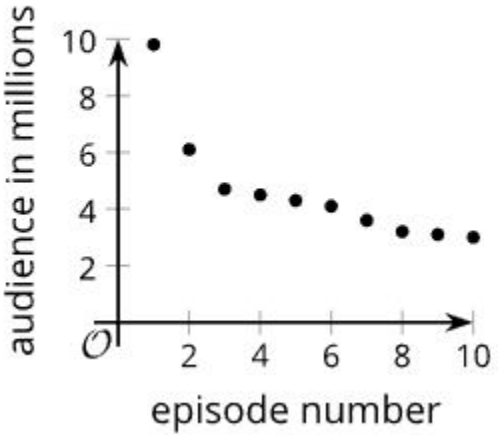
9.3 Activity (15 minutes)

What do you notice?

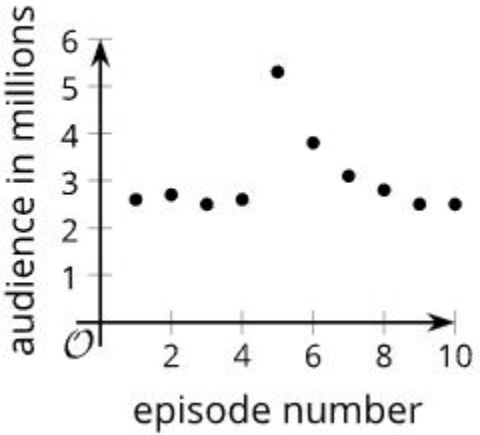
Show A



Show B



Show C



On the whiteboards….
Use the graphs and descriptions
to Complete #1,2 & 3

Functions f and g

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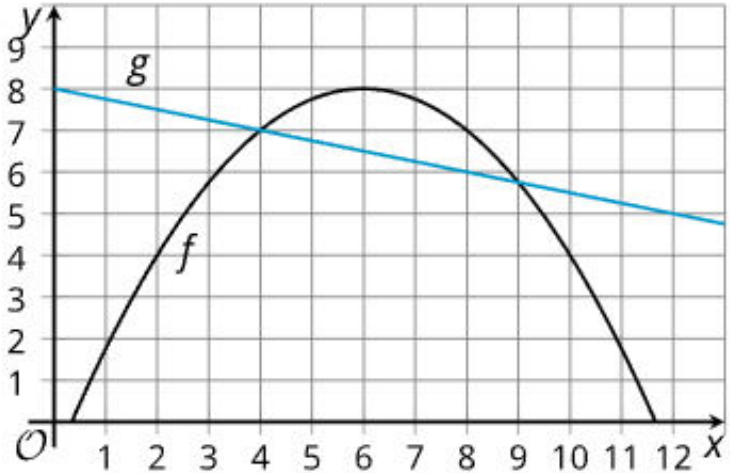
9.4 Activity (10 minutes)

9.4: Functions f and g

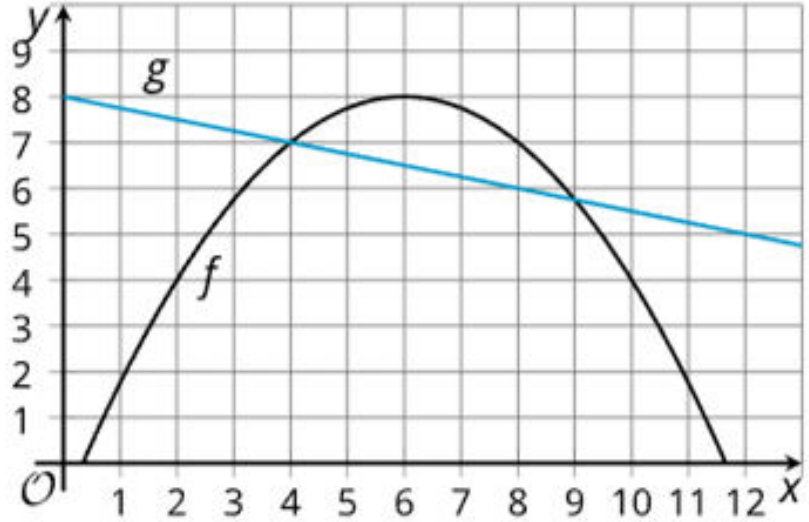
1. Here are graphs that represent two functions, f and g.

Decide which function value is greater for each given input. Be prepared to explain your reasoning.

a. $f(2)$ or $g(2)$
b. $f(4)$ or $g(4)$
c. $f(6)$ or $g(6)$
d. $f(8)$ or $g(8)$



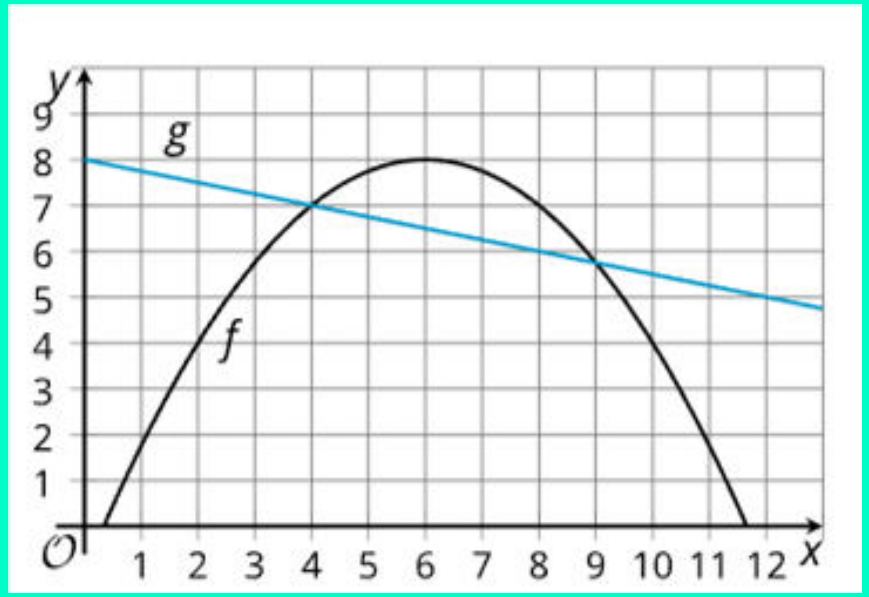
Write all responses in your packet.



2. Is there a value of x at which the equation $f(x) = g(x)$ is true? Explain your reasoning.
3. Identify at least two values of x at which the inequality $f(x) < g(x)$ is true.

Write all responses in your packet.

Synthesis



We can use function notation to compare function values.

$f(2) < g(2), f(4) = g(4), f(6) > g(6)$, and $f(8) > g(8)$

$f(x) = g(x)$ $f(4) = g(4)$ $(4, f(4))$ and $(4, g(4))$

Did we meet our goals?

- I can compare the features of graphs of functions and explain what they mean in the situations represented.
- I can make sense of an equation of the form $f(x)=g(x)$ in terms of a situation and a graph, and know how to find the solutions.
- I can make sense of statements about two or more functions when they are written in function notation.

A Toy Rocket and a Drone Again

Cool Down