### Lesson 19 Practice Problems

1. Functions and are given below. Classify each function as linear, exponential, or neither.
2. Here are 4 equations defining 4 different functions, and . List them in order of increasing rate of change. That is, start with the one that grows the slowest and end with the one that grows the quickest.
3. *Technology required*. Function  is defined by and function  is defined by .
   1. Complete the table with values of and . When necessary, round to 2 decimal places.
   2. Which function do you think grows faster? Explain your reasoning.
   3. Use technology to create graphs representing and . What graphing window do you have to use to see the value of where becomes greater than for that ?

|  |  |  |
| --- | --- | --- |
| * 1 |  |  |
| * 5 |  |  |
| * 10 |  |  |
| * 20 |  |  |

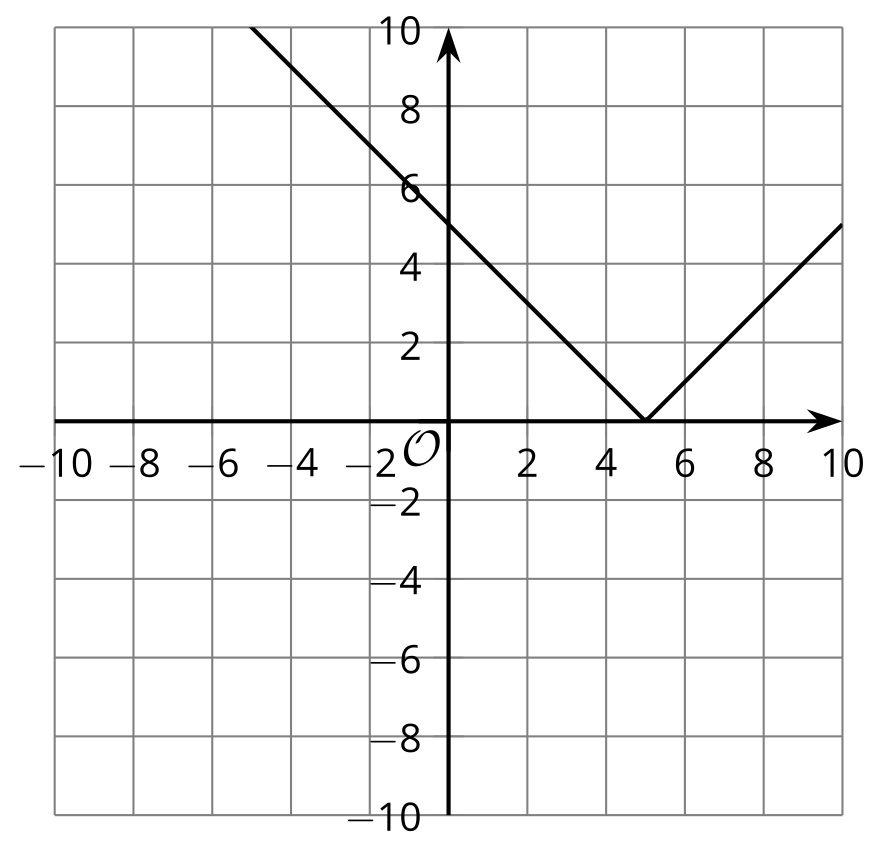
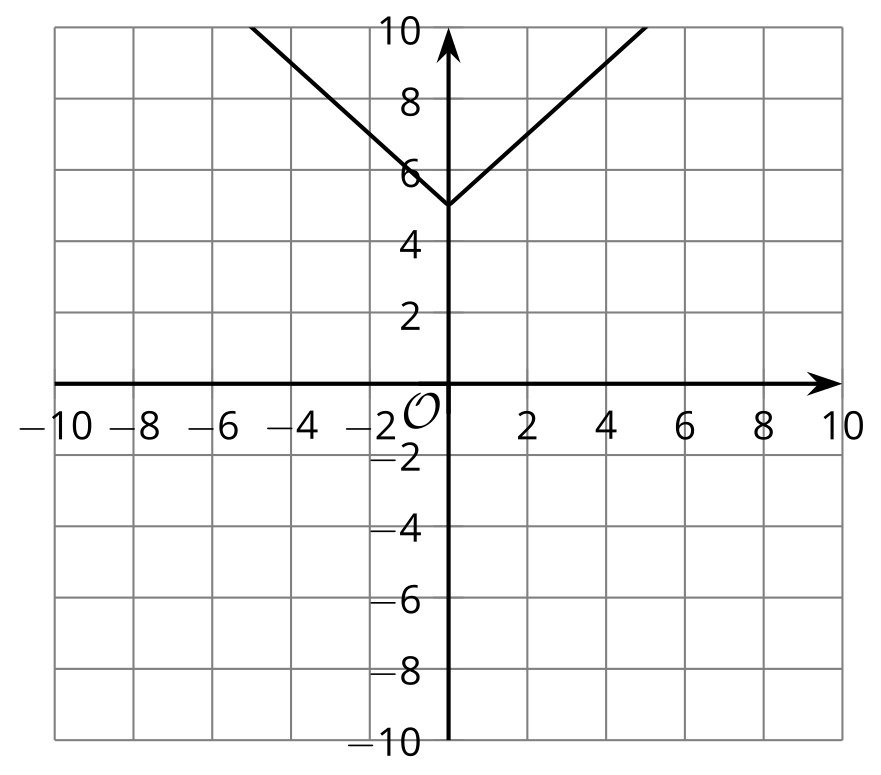
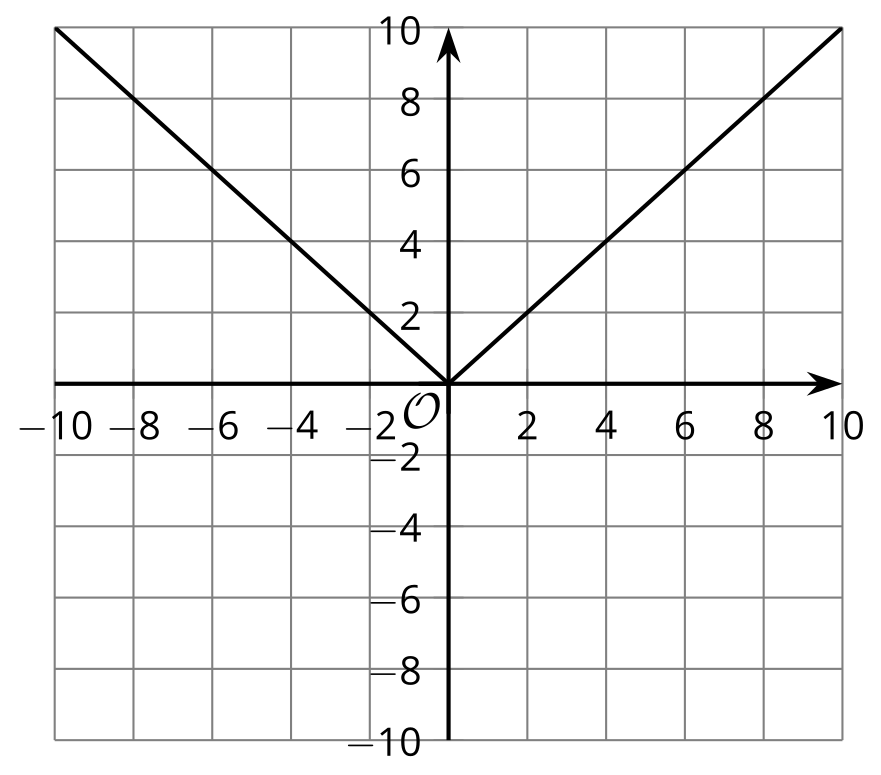
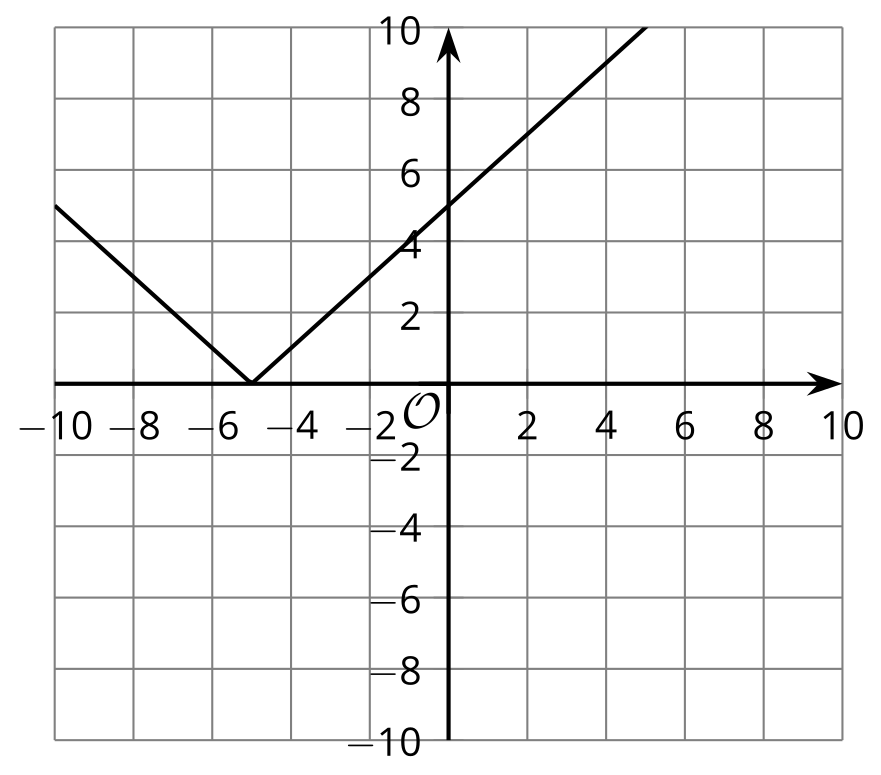
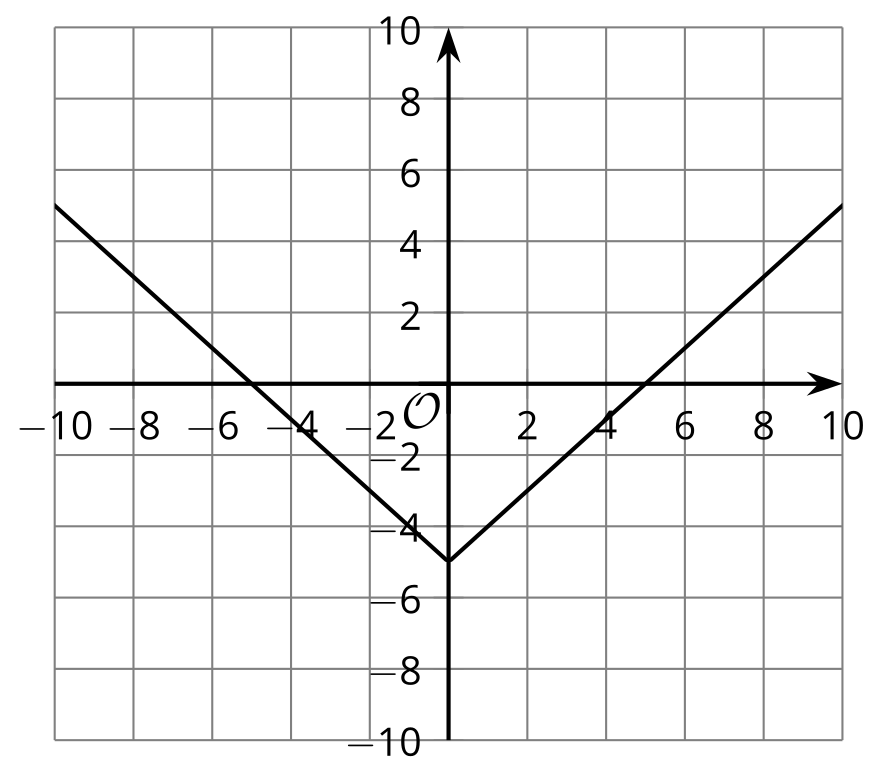
1. Functions and are given by and . As increases from 0:
   1. Which function reaches 30 first?
   2. Which function reaches 100 first?
2. The functions and are defined by and .
   1. Which function eventually grows faster,  or ? Explain how you know.
   2. Explain why the graphs of and meet for a positive value of .
3. A line segment of length is scaled by a factor of 1.5 to produce a segment with length . The new segment is then scaled by a factor of 1.5 to give a segment of length .

* What scale factor takes the segment of length  to the segment of length ? Explain your reasoning.
* (From Unit 5, Lesson 16.)

1. A couple needs to get a loan of $5,000 and has to choose between three options.
   * Option A: applied quarterly
   * Option B: applied every 4 months
   * Option C: applied semi-annually

* If they make no payments for 5 years, which option will give them the least amount owed after 5 years? Use a mathematical model for each option to explain your choice.
* (From Unit 5, Lesson 17.)

1. Here are graphs of five absolute value functions. Match the graph and equation that represent the same function.

* Graph 1
* 
* Graph 2
* 
* Graph 3
* 
* Graph 4
* 
* Graph 5
* 
* 1. Graph 1
  2. Graph 2
  3. Graph 3
  4. Graph 4
  5. Graph 5
* (From Unit 4, Lesson 14.)



© CC BY 2019 by Illustrative Mathematics®