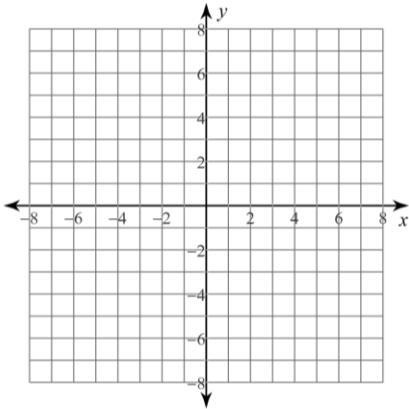


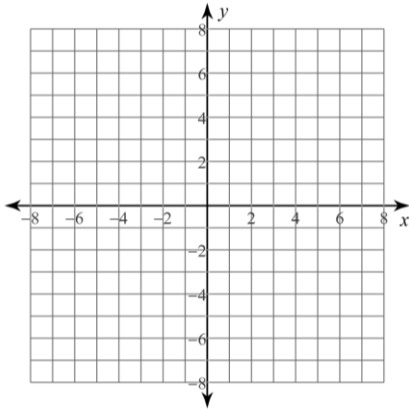
# 7.2.D2 - PIECEWISE DEFINED FUNCTIONS

Sketch the graph of each piecewise function.

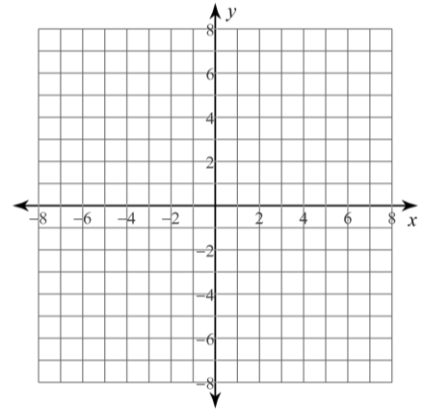
$$1. f(x) = \begin{cases} -\frac{1}{3}x + 2 & x \leq 0 \\ x - 5 & x > 0 \end{cases}$$



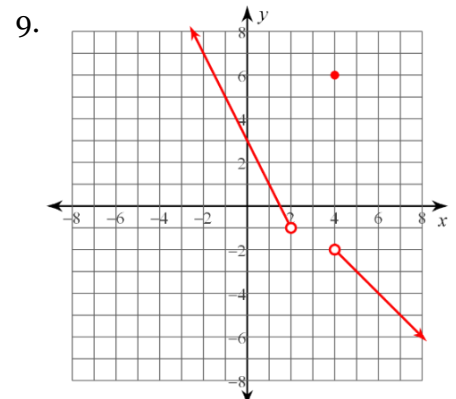
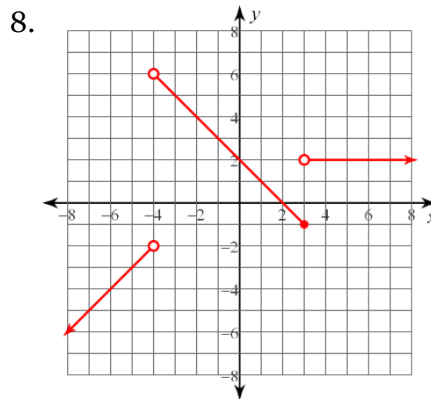
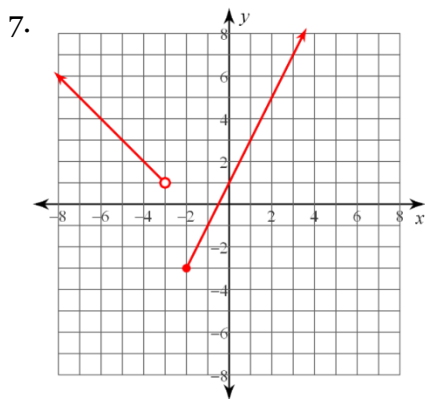
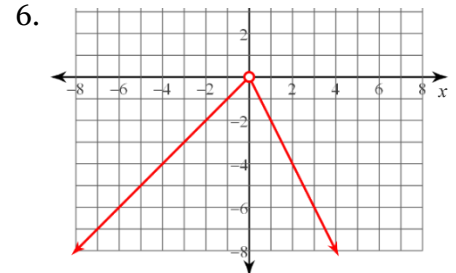
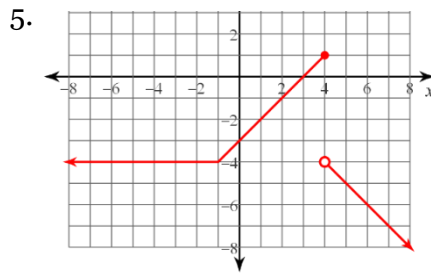
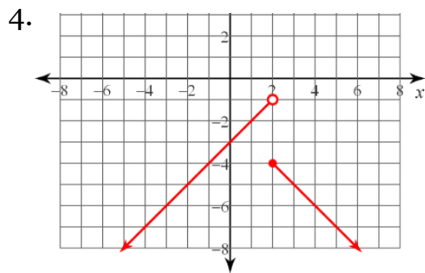
$$2. g(x) = \begin{cases} \frac{1}{2}x - 1 & x < 0 \\ -2x & x \geq 0 \end{cases}$$



$$3. h(x) = \begin{cases} x + 1 & x \leq -3 \\ 4 & -3 < x < 4 \\ 2 - x & x \geq 4 \end{cases}$$



Write a piecewise defined function for the function shown.



10. **MODELING WITH MATHEMATICS** On a trip, the total distance (in miles) you travel in  $x$  hours is represented by the piecewise function

$$d(x) = \begin{cases} 55x, & \text{if } 0 \leq x \leq 2 \\ 65x - 20, & \text{if } 2 < x \leq 5 \end{cases}$$

How far do you travel in 4 hours?

11. **MODELING WITH MATHEMATICS** The total cost (in dollars) of ordering  $x$  custom shirts is represented by the piecewise function

$$c(x) = \begin{cases} 17x + 20, & \text{if } 0 \leq x < 25 \\ 15.80x + 20, & \text{if } 25 \leq x < 50 \\ 14x + 20, & \text{if } x \geq 50 \end{cases}$$

Determine the total cost of ordering 26 shirts.

12. A city parking lot uses the following rules to calculate parking fees:
- A flat rate of \$5 for any amount of time up to and including the first hour.
  - A flat rate of \$12.50 for any amount of time over 1 hour and up to and including 2 hours.
  - A flat rate of \$13 plus \$3 per hour for each hour after 2 hours; maximum of 10 hours.
- a. Write a piecewise function that expresses the parking fee,  $F$ , as a function of the time in hours,  $t$ .
- b. What is the parking fee if you park for 6 hours?
- c. What is the practical domain?
- d. What is the practical range?
13. Your favorite dog groomer charges according to your dog's weight. If your dog is 15 pounds and under, the groomer charges \$35. If your dog is between 15 and 40 pounds, she charges \$40. If your dog is 40 pounds or over, she charges \$40, plus an additional \$2 for each pound over 40. She does not groom any dogs over 70 pounds; those dogs are just too much for her to handle.
- a. Write a piecewise function that expresses the groomer's charges,  $C$ , as a function of a dog's weight in pounds,  $w$ .
- b. What would the groomer charge if your cute dog weighs 60 pounds?
- c. What is the practical domain?
- d. What is the practical range?