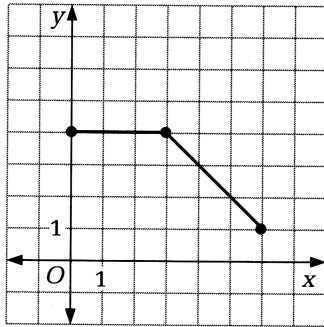


# Practice 12

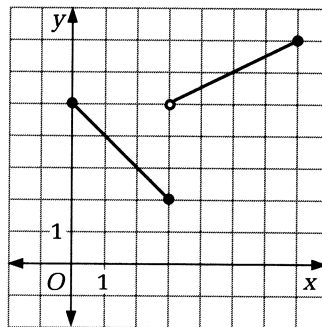
For use with Section 2-3

For each graph, write a rule for the piecewise function graphed.

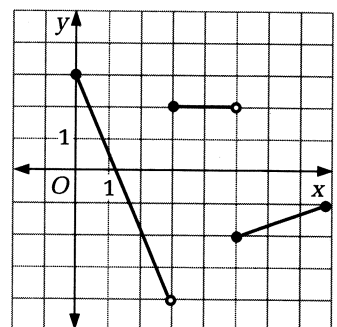
1.



2.



3.



Graph each piecewise function.

$$4. f(x) = \begin{cases} 2 - x & \text{if } 0 \leq x < 3 \\ -1 & \text{if } 3 \leq x \leq 5 \end{cases}$$

$$5. f(x) = \begin{cases} 2x - 4 & \text{if } x < 2 \\ \frac{1}{2}x - 1 & \text{if } x \geq 2 \end{cases}$$

$$6. f(x) = \begin{cases} 1 & \text{if } 0 \leq x < 2 \\ 2 & \text{if } 2 \leq x < 4 \\ 3 & \text{if } 4 \leq x \leq 6 \end{cases}$$

$$7. f(x) = \begin{cases} \frac{x}{3} & \text{if } 0 \leq x < 3 \\ 1 & \text{if } 3 \leq x \leq 6 \\ -\frac{x}{3} + 3 & \text{if } 6 < x \leq 9 \end{cases}$$

Graph each absolute value function.

8.  $y = |3 - x|$

9.  $y = |x - 4|$

10.  $y = 2|x| - 3$

11.  $y = \frac{1}{2}|x + 1| + 2$

12.  $y = -\frac{|x|}{3} + 2$

13.  $y = -2|x - 1| + 4$

14. Under a graduated income tax system, different incomes are taxed at different rates. Suppose a function that gives the tax  $T(i)$  on a person's income  $i$  in a certain state is

$$T(i) = \begin{cases} 0.03i & \text{if } 0 \leq i \leq 20,000 \\ 600 + 0.08(i - 20,000) & \text{if } 20,000 < i \leq 50,000 \\ 3000 + 0.15(i - 50,000) & \text{if } i > 50,000 \end{cases}$$

- a. Graph the function  $T(i)$ .
- b. What is the tax on an income of \$10,000? of \$54,000?
15. **Writing** For the state whose tax is given by the function in Exercise 14, write instructions to taxpayers telling them how much tax they owe. Include specific percentages for each income bracket (that is, for each interval of the domain).