Simplify each expression.

1. $\dfrac{a^2 - ab}{3a} \div \dfrac{a - b}{15b^2}$

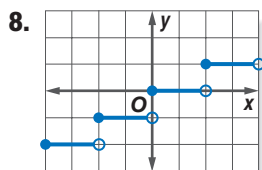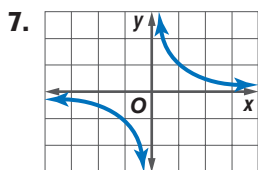2. $\dfrac{x^2 - y^2}{y^2} \cdot \dfrac{y^3}{y - x}$

3. $\dfrac{x^2 - 2x + 1}{y - 5} \div \dfrac{x - 1}{y^2 - 25}$

4. $\dfrac{\dfrac{x^2 - 1}{x^2 - 3x - 10}}{\dfrac{x^2 + 3x + 2}{x^2 - 12x + 35}}$

5. $\dfrac{x - 2}{x - 1} + \dfrac{6}{7x - 7}$

6. $\dfrac{x}{x^2 - 9} + \dfrac{1}{2x + 6}$

Identify the type of function represented by each graph.

7.

8.

Graph each rational function.

9. $f(x) = \dfrac{-4}{x - 3}$

10. $f(x) = \dfrac{2}{(x - 2)(x + 1)}$

Solve each equation or inequality.

11. $\dfrac{2}{x - 1} = 4 - \dfrac{x}{x - 1}$

12. $\dfrac{9}{28} + \dfrac{3}{z + 2} = \dfrac{3}{4}$

13. $5 + \dfrac{3}{t} > -\dfrac{2}{t}$

14. $x + \dfrac{12}{x} - 8 = 0$

15. $\dfrac{5}{6} - \dfrac{2m}{2m + 3} = \dfrac{19}{6}$

16. $\dfrac{x - 3}{2x} = \dfrac{x - 2}{2x + 1} - \dfrac{1}{2}$

17. If y varies inversely as x and $y = 9$ when $x = -\dfrac{2}{3}$, find x when $y = -7$.

18. If g varies directly as w and $g = 10$ when $w = -3$, find w when $g = 4$.

19. Suppose y varies jointly as x and z. If $x = 10$ when $y = 250$ and $z = 5$, find x when $y = 2.5$ and $z = 4.5$.

20. **AUTO MAINTENANCE** When air is pumped into a tire, the pressure required varies inversely as the volume of the air. If the pressure is 30 pounds per square inch when the volume is 140 cubic inches, find the pressure when the volume is 100 cubic inches.

21. **WORK** Sofia and Julie must pick up all of the apples in the yard so the lawn can be mowed. Working alone, Julie could complete the job in 1.7 hours. Sofia could complete it alone in 2.3 hours. How long will it take them to complete the job when they work together?

ELECTRICITY **For Exercises 22 and 23, use the following information.**
The current I in a circuit varies inversely with the resistance R.

22. Use the table below to write an equation relating the current and the resistance.

I	0.5	1.0	1.5	2.0	2.5	3.0	5.0
R	12.0	6.0	4.0	3.0	2.4	2.0	1.2

23. What is the constant of variation?

24. **MULTIPLE CHOICE** If $m = \dfrac{1}{x}$, $n = 7m$, $p = \dfrac{1}{n}$, $q = 14p$, and $r = \dfrac{1}{\frac{1}{2}q}$, find x.

A r **B** q **C** p **D** $\dfrac{1}{r}$