

Chapter 9 Review

Determine the value(s) of x for which the function is not defined.

1. $fx = \frac{-7}{x+5}$

2. $fx = \frac{7}{x^2 - 19x + 84}$

Simplify the given expression.

3. $\frac{3p^4}{5q^5(r-5)^3} \cdot \frac{37q^2(r-5)}{30p^3}$

4. $\frac{5(a^2 + 5a + 6)}{3(a^2 - 36)} \div \frac{41(a+3)}{6(a+6)}$

5. $\frac{\frac{8x^2 - 8}{x}}{8(x^2 + 8)} \div \frac{26x^2 - 31x}{26x^2 - 31x}$

Find the LCM of the set of polynomials.

6. $121x^2 - 9y^2, 11x^2 + 3yx$

7. $29a^3c, 16b^4, b^2c^2$

Simplify the given expression.

8. $\frac{3}{4x^2 - 25} + \frac{2}{2x + 5}$

9. $\frac{19}{xy^2} - \frac{7y^2}{8x^2}$

10. $\frac{8}{y+2} - \frac{3y}{y^2 - 4}$

Determine the equations of any vertical asymptotes and the values of x for any holes in the graph of the rational function.

11. $f(x) = \frac{3}{x^2 - 14x + 48}$

12. $f(x) = \frac{x-6}{x^2 - 7x + 6}$

Graph the rational function.

13. $f(x) = \frac{x}{x-12}$

14. If y varies directly as x and $y = 28$ when $x = 4$, find y when $x = 20$.

15. Suppose y varies jointly as x and z . Find y when $x = 2$ and $z = 11$, if $y = 160$ when $x = 3$ and $z = 8$. Round your answer to the nearest hundredth, if necessary.

16. If y varies inversely as x and $y = 194$ when $x = -13$, find y when $x = 50$. Round your answer to the nearest hundredth, if necessary.

It has been found that the average number of daily phone calls C between two cities is directly proportional to the populations P_1 and P_2 of the two cities and inversely proportional to the square of the distance d between the cities.

17. The distance between Albany, New York, and Cleveland, Ohio, is about 480 miles. If the average number of daily phone calls between the cities is 250,000, find the value of k and write the equation of variation. Round to the nearest thousandth. The population of Albany and Cleveland is 95,000 and 2,900,000 respectively.

18. Many areas of Northern California directly depends on the snowpack of the Sierra Nevada Mountains for their water supply. If 300 cubic centimeters of snow will melt to 33 cubic centimeters of water, how much water does 600 cubic centimeters of snow produce?

Solve the given equation. Round answers to the nearest hundredth, if necessary.

19. $\frac{x}{x+2} = \frac{2}{19}$

Solve the inequality. Check your solution.

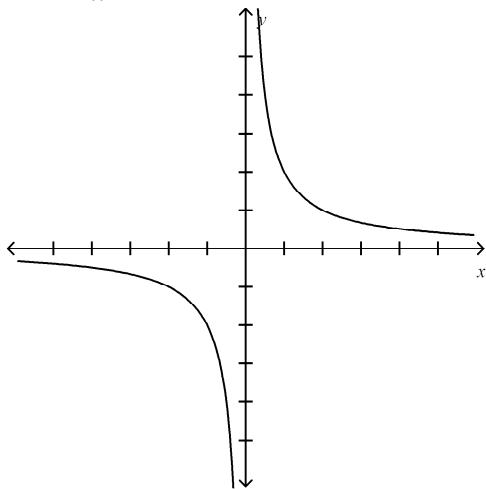
20. $\frac{5}{b+1} > 5$

21. $\frac{8}{2p} + \frac{5}{4p} < \frac{1}{2}$

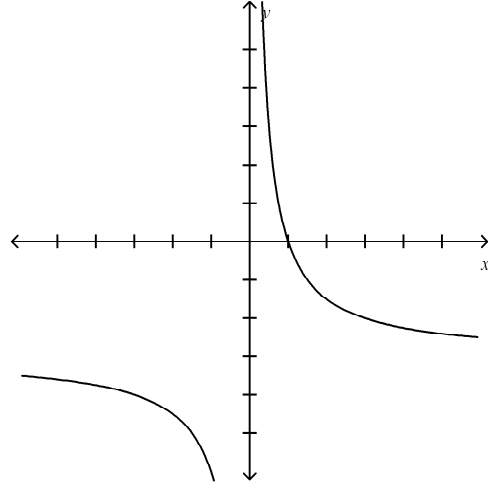
22. Denise can clean the house in 4 hours, whereas her sister Angela can do the same work in 3 hours. They decide to work together so that they can finish the work before their aunt arrives. How long will it take them to clean the house together?

State the asymptotes, domain, and range of the function.

23. $f(x) = \frac{2}{x}$



24. $f(x) = \frac{3}{x} - 3$



25. Graph the rational function $f(x) = \frac{x^2 + 5x}{x + 5}$.

26. Graph the rational function $f(x) = \frac{-2}{(x-2)(x+4)}$.

27. The distance a spring stretches varies directly with the weight on the spring. If a spring stretches 7.5 inches with 55 pounds attached, how far will it stretch when 38 pounds are attached?
28. The pressure exerted on the walls of a container by a gas enclosed within it is directly proportional to the temperature of the gas. If the pressure is 6 pounds per square inch when the temperature is 440° F, find the pressure exerted when the temperature of the gas is 380° F.
29. Blake and Ned work for a home remodeling business. They are putting the final touches on a home they renovated. Working alone, Blake can paint one room in 9 hours. Ned can paint the same room in 6 hours. How long will it take them to paint the room if they work together?
30. An aircraft flying at a steady rate travels 3840 miles with the wind. It can travel only 3260 miles against the wind in the same amount of time. If the speed of the wind is 25 miles per hour, find the speed of the aircraft in calm air.