Suppose that x and y vary inversely. Write a function that models each inverse variation and find y when $x = 10$.

1. $x = 3$ when $y = 2$

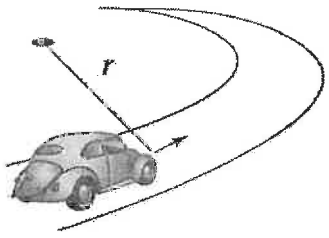
2. $x = 4$ when $y = -1$

3. $x = 5$ when $y = 8$

4. Sound intensity is inversely proportional to the square of the distance from the source—the farther from the source you are, the less intense the sound. Suppose the sound intensity is 30 watts per square meter (W/m^2) at 8 meters. What is the sound intensity at 4 meters?

5. The maximum load a cylindrical column can support varies directly as the fourth power of the diameter and inversely as the square of the height. A column that is 2 ft in diameter and 10 ft high can support up to 6 tons. If a column is 1 ft in diameter and 12 ft high, what is the maximum load it can support?

6. The force required to keep a car from skidding in a turn varies jointly with the mass of the car m, the square of its speed v, and the curvature k of the turn. The curvature is the reciprocal of the radius of the turn, $k = \frac{1}{r}$. Suppose it takes 2800 lb of force to keep an 1800-lb car from skidding at 45 mi/h on a curve with radius 425 ft. What force is needed to keep the car from skidding at 50 mi/h on a curve with a radius of 440 ft?



Lesson 8-2

Sketch the asymptotes and the graph of each function. Identify the domain and the range.

7. $y = \frac{8}{x} - 1$

8. $y = \frac{1}{x-2} + 1$

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

Write an equation for the translation of $y = \frac{4}{x}$ **that has the given asymptotes.**

10. $x = 0$ and $y = 3$

11. $x = 1$ and $y = -1$

12. $x = -2$ and $y = -4$

8.4-8.6

Simplify each and state the excluded values.

1) $\frac{15k^2}{12k^3}$

2) $-\frac{20r^4}{12r^5}$

3) $\frac{p^2-p-30}{p+5}$

4) $\frac{p^2-7p+10}{p-2}$

5) $\frac{6x^2-48x}{x^2-2x-48}$

6) $\frac{b^2-6b-40}{b^2-b-90}$

7) $\frac{m^2+10m+16}{m^2-3m-10}$

8) $\frac{8x+16}{x^2-6x-16}$

9) $\frac{5x}{3} \cdot \frac{5x^2}{4x^2}$

10) $\frac{6b}{5b^3} \cdot \frac{6b}{7}$

11) $\frac{a^2-9}{a-3} \cdot \frac{3a^3+9a^2}{a^2+6a+9}$

12) $\frac{4a^2-4a}{a^2-1} \cdot \frac{3a+3}{6a-6}$

13) $\frac{a^2-4a+3}{3a-9} \cdot \frac{3a+6}{a^2-a-6}$

14) $\frac{b^2+3b+2}{6b} \cdot \frac{b-3}{b^2-b-6}$

15) $\frac{3}{2n} \div \frac{3n}{2}$

16) $\frac{2k^2+6k}{k+2} \div \frac{k^2-4}{k^2+4k+4}$

17) $\frac{3n-9}{n+1} \div \frac{3n^2-9n}{n^2-2n-3}$

18) $\frac{x^2-4}{3x+6} \div \frac{x^2-4x+4}{x^2-4}$

Simplify each expression.

19) $\dfrac{3p+5}{4p+12} - \dfrac{p-2}{4p+12}$

20) $\dfrac{6n+3}{12n+12} + \dfrac{n-1}{12n+12}$

21) $\dfrac{x-y}{6} + \dfrac{x+2y}{2x^2y}$

22) $\dfrac{2k}{k+2} - \dfrac{2}{2k+5}$

23) $\dfrac{3v}{v-1} + \dfrac{2}{v-4}$

24) $\dfrac{6v}{v+6} + \dfrac{4v^2}{v^2+10v+24}$

25) $\dfrac{n-5}{n^2+7n+6} - \dfrac{5}{n^2+3n-18}$

26) $\dfrac{\frac{1}{5}}{\frac{x^2}{9}}$

27) $\dfrac{\frac{x+1}{x^2}}{\frac{25}{x^2}}$

28) $\dfrac{\frac{1}{x}+\frac{x^2}{3}}{\frac{1}{4}}$

29) $\dfrac{\frac{2}{x}+\frac{1}{2}}{\frac{2}{x^2}-\frac{4}{x^2}}$

30) $\dfrac{\frac{20}{x}+\frac{4}{x-4}}{\frac{1}{5}-\frac{20}{x-4}}$

Solve each equation. Remember to check for extraneous solutions.

31) $\dfrac{5}{x^2}+\dfrac{6}{x}=\dfrac{2}{x^2}$

32) $1+\dfrac{5v-15}{2v}=\dfrac{1}{2}$

33) $\dfrac{3a-12}{2a}=\dfrac{1}{2}-\dfrac{1}{2a}$

34) $\dfrac{x+2}{3x^2-15x+12}=\dfrac{x+6}{x^2-5x+4}-\dfrac{4}{3x-3}$

35) $\dfrac{5}{p^2+10p+25}=\dfrac{1}{p+5}-\dfrac{1}{p^2+10p+25}$

36) $\dfrac{2m-12}{m-5}=1-\dfrac{m-6}{m-5}$