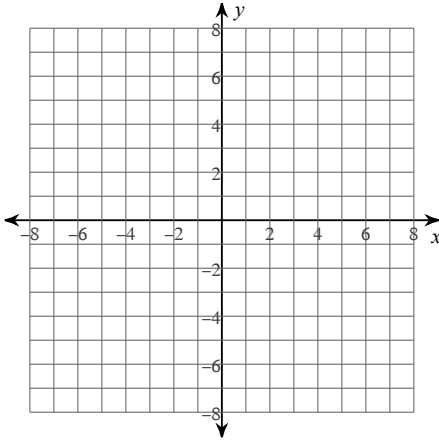


Chapter 9: Rational Equations and Functions

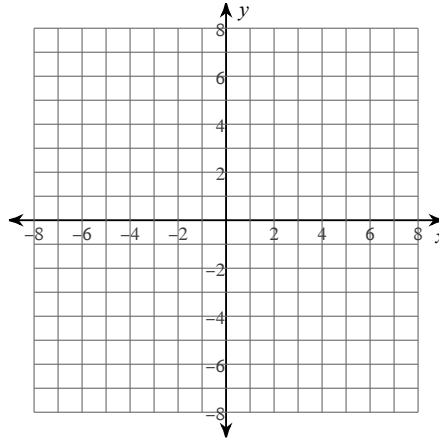
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Graph each function.

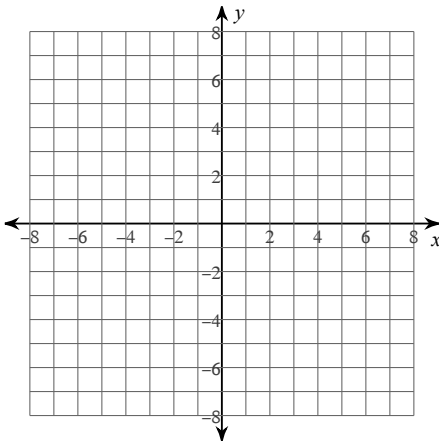
1) $f(x) = \frac{2}{x-2} - 3$



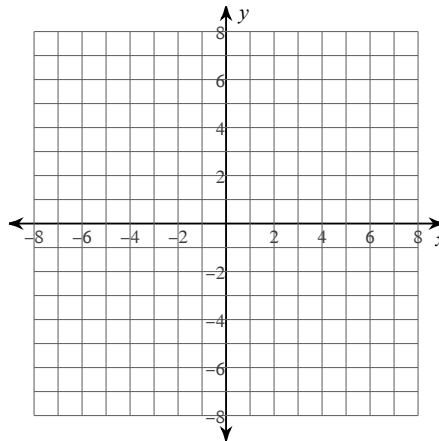
2) $f(x) = -\frac{2}{x+2}$



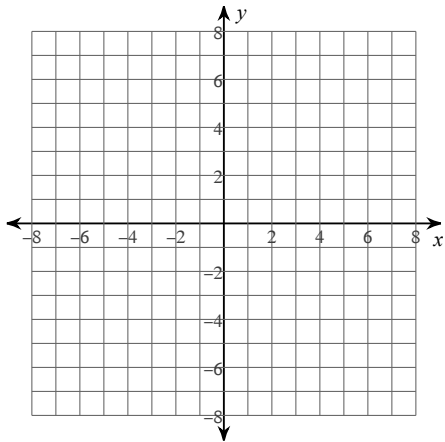
3) $f(x) = \frac{2}{x+1} - 1$



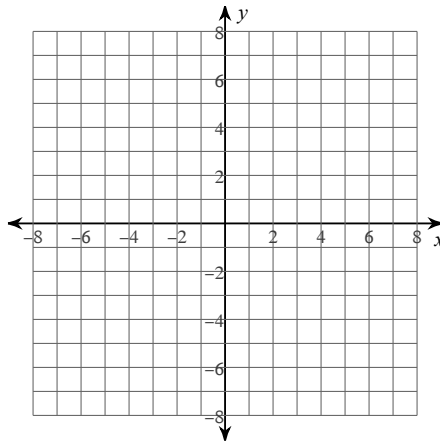
4) $f(x) = \frac{3}{x+1} - 1$



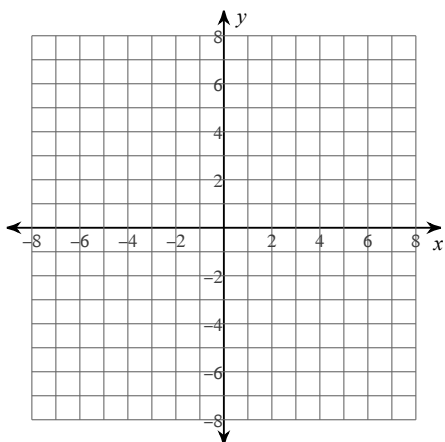
$$5) f(x) = \frac{-x - 2}{x^2 + 2x - 3}$$



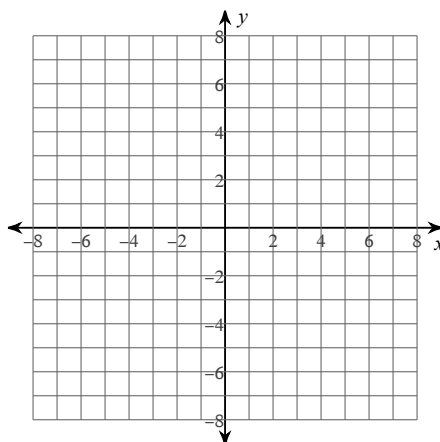
$$6) f(x) = \frac{x^3 - 5x^2 + 4x}{4x^2 - 4x - 24}$$



$$7) f(x) = \frac{x^2 - 4}{x^2 - x - 2}$$



$$8) f(x) = \frac{x^2 - x - 12}{-x^2 + 16}$$



Simplify each expression.

$$9) \frac{5x - 3}{15x + 3} + \frac{5x}{2}$$

$$10) \frac{5}{5x + 4} + \frac{2}{x - 5}$$

$$11) \frac{3p}{3p - 6} - \frac{2}{5p - 6}$$

$$12) \frac{6}{p - 6} + \frac{5p}{p + 4}$$

$$13) \frac{3n}{2} + \frac{n - 3}{3n^3 + 6n^2 - 9n}$$

$$14) \frac{5m}{m - 5} + \frac{m - 1}{10m - 6}$$

15)
$$\frac{m-3}{3m^2-3m-6} - \frac{5m}{3}$$

16)
$$\frac{5n}{3n^2-27n+60} + \frac{2}{3}$$

17)
$$\frac{15n^3-40n^2}{n+9} \div \frac{21n-56}{10n^3+90n^2}$$

18)
$$\frac{12r-40}{r^2-2r-48} \cdot \frac{r^2-2r-48}{6r-20}$$

19)
$$\frac{4+3n-n^2}{n+1} \div \frac{n^2-2n-8}{42n^2}$$

20)
$$\frac{7n-35}{4n-28} \cdot \frac{9}{9n-45}$$

21)
$$\frac{5}{25n+20} \div \frac{9n+18}{25n+20}$$

22)
$$\frac{10r-90}{r^2-14r+45} \div \frac{1}{r^2-10r+25}$$

23)
$$\frac{\frac{u}{5} - \frac{u+5}{5}}{\frac{u+5}{u^2}}$$

24)
$$\frac{\frac{x+5}{x+4}}{\frac{x+4}{x+3} - \frac{x+4}{x+5}}$$

25)
$$\frac{\frac{x^2-4x}{x^2}}{x-4} + \frac{x-4}{x^2}$$

26)
$$\frac{\frac{1}{8} - \frac{x}{2}}{\frac{x-4}{16} + \frac{x-4}{2}}$$

27)
$$\frac{\frac{9}{x-5} - \frac{x}{x-5}}{\frac{x^2}{x-5} - \frac{2}{x-5}}$$

28)
$$\frac{\frac{3}{a-4} - \frac{a}{16}}{\frac{a^2}{12} + \frac{a}{16}}$$

Solve each equation. Remember to check for extraneous solutions.

29)
$$\frac{1}{3k} - \frac{4k-16}{6k^2-15k} = \frac{4k+8}{6k^2-15k}$$

30)
$$\frac{1}{x-5} = 4 + \frac{6}{x-5}$$

31)
$$\frac{2m-6}{m^2+9m+20} - \frac{m-3}{m^2+9m+20} = \frac{1}{3m+15}$$

32)
$$\frac{1}{p^2-5p-6} + \frac{4}{p+1} = \frac{2}{p^2-5p-6}$$

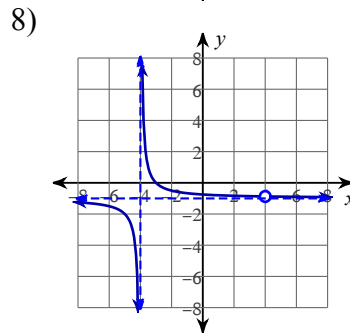
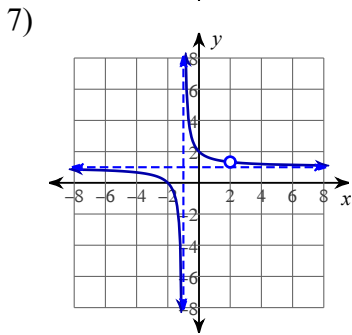
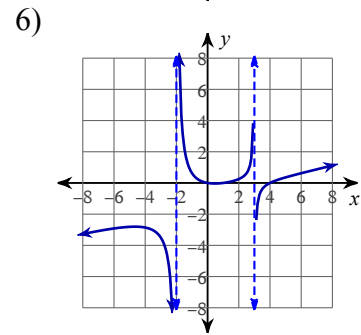
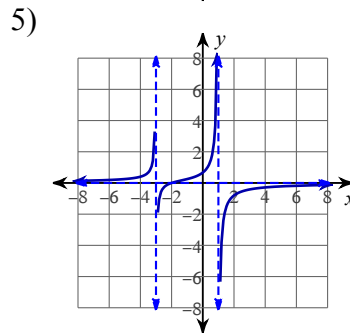
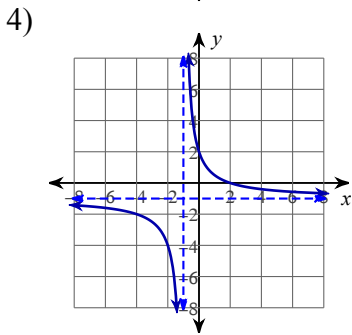
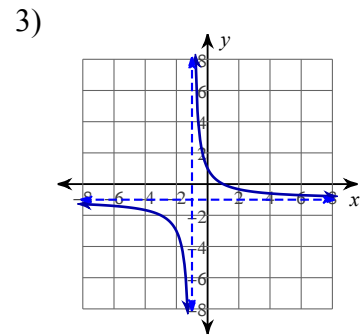
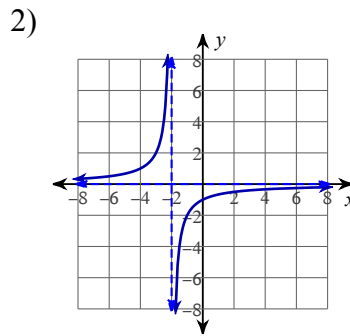
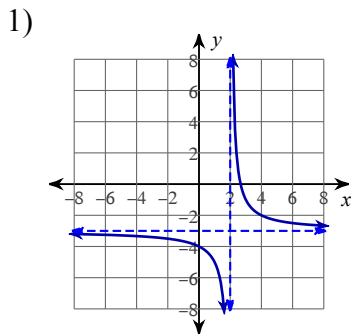
33)
$$\frac{x+5}{x} - \frac{5}{x-3} = \frac{x^2-7x+6}{x^2-3x}$$

34)
$$2 = \frac{1}{3x^2+30x+75} + \frac{1}{3x+15}$$

$$35) \frac{b-6}{b} = \frac{b-4}{b} + \frac{b-6}{b^2+2b}$$

$$36) \frac{1}{b^2+6b} = \frac{b-4}{b} - \frac{b+2}{b}$$

Answers to Chapter 9: Rational Equations and Functions (ID: 2)



9)
$$\frac{25x - 6 + 75x^2}{6(5x + 1)}$$

10)
$$\frac{15x - 17}{(x - 5)(5x + 4)}$$

11)
$$\frac{5p^2 - 8p + 4}{(p - 2)(5p - 6)}$$

12)
$$\frac{-24p + 24 + 5p^2}{(p - 6)(p + 4)}$$

13)
$$\frac{9n^4 + 18n^3 - 27n^2 + 2n - 6}{6n(n - 1)(n + 3)}$$

14)
$$\frac{51m^2 - 36m + 5}{2(m - 5)(5m - 3)}$$

15)
$$\frac{11m - 3 - 5m^3 + 5m^2}{3(m - 2)(m + 1)}$$

16)
$$\frac{-13n + 2n^2 + 40}{3(n - 5)(n - 4)}$$

17)
$$\frac{50n^4}{7}$$

18) 2

19)
$$-\frac{42n^2}{n + 2}$$

20)
$$\frac{7}{4(n - 7)}$$

21)
$$\frac{5}{9(n + 2)}$$

22) $10(r - 5)$

23)
$$-\frac{u^2}{u + 5}$$

24)
$$\frac{x^3 + 13x^2 + 55x + 75}{2x^2 + 16x + 32}$$

25)
$$\frac{x^5 - 8x^4 + 16x^3}{x^4 + x^2 - 8x + 16}$$

26)
$$\frac{2 - 8x}{9x - 36}$$

27)
$$\frac{9 - x}{x^2 - 2}$$

28)
$$\frac{144 - 3a^2 + 12a}{4a^3 - 13a^2 - 12a}$$

29)
$$\left\{ \frac{1}{2} \right\}$$

30)
$$\left\{ \frac{15}{4} \right\}$$

31)
$$\left\{ \frac{13}{2} \right\}$$

32)
$$\left\{ \frac{25}{4} \right\}$$

33)
$$\left\{ \frac{21}{4} \right\}$$

34)
$$\left\{ -\frac{9}{2}, -\frac{16}{3} \right\}$$

35)
$$\left\{ \frac{2}{3} \right\}$$

36)
$$\left\{ -\frac{37}{6} \right\}$$