WIR: Sections 5.3 and 5.4

Section 5.3

(1) For the rational functions below state the domain, the x-intercept(s), the y-intercept, any vertical asymptotes, the coordinates of any holes, and the end behavior.

(a) $f(x) = \dfrac{3x^2 - 12x - 15}{x^2 + 2x - 24}$

(b) $g(x) = \dfrac{2x(2x-1)}{(2x-1)(x+3)}$

(c) $h(x) = \dfrac{x^2 + 3x}{(2x-5)(x+3)}$

(d) $p(x) = \dfrac{3x(x-1)}{(x-1)^2(x+4)}$

(2) Perform the indicated operation and simplify the result.

(a) $\dfrac{x-2}{x+3} + \dfrac{x+1}{x}$

(b) $\dfrac{2x-1}{x+3} - \dfrac{2x+5}{2x^2+7x+3}$

(c) $\dfrac{x^2-9}{3x^2-6x+3} \cdot \dfrac{x^2+4x-5}{x^2-25}$

(d) $\dfrac{2x^2+16x}{x^3-16x} \div \dfrac{3x^2+12x-96}{x^2+6x+8}$

(e) $\dfrac{x+1}{x-3} - \dfrac{3}{x+2} \div \dfrac{x^2-5x+6}{x^2-4}$

(3) Compute and simplify the difference quotient for

(a) $g(x) = \dfrac{-2}{x+3}$

(b) $f(x) = 2x^2 - 5x$

Section 5.4

(4) Simplify the expression $-6x^{-4}y^5\left(12xy^{-3}\right)^{-2}$. Assume $(x, y > 0)$

(5) Rewrite $g(x) = \dfrac{4\sqrt[5]{(3x^2+x)^4}}{12}$ is its equivalent exponent form.

(6) Rewrite $f(x) = 8(4x^2+3)^{-2/3}$ equivalent radical form.

(7) State the domain of each function, using interval notation.

(a) $f(x) = \sqrt[5]{2x+1}$

(b) $g(x) = \sqrt[4]{2x+1}$

(c) $p(x) = \dfrac{3}{\sqrt[5]{2x+1}}$

(d) $z(x) = \dfrac{x-3}{\sqrt{8-x}}$

(e) $n(x) = \dfrac{x^2-3x-4}{\sqrt[9]{x^2-64}}$

(f) $y(x) = \dfrac{\sqrt[4]{-2x+10}}{\sqrt[3]{x^2-16}}$

(8) Compute and simplify the difference quotient for $g(x) = -6(x-4)^{1/2}$.