

Key

Math 4

U3 L3 I2 Part 1 Learn Check

Name _____

Date _____

In this learning check, you are being assessed on the following learning goals:

I can identify important characteristics (asymptotes, holes, intercepts, and end behavior) of rational functions

In numbers 1-4, find the below information

$$1. \quad f(x) = \frac{(3x-4)(x+2)}{x^2-4} = \frac{(3x-4)\cancel{(x+2)}}{\cancel{(x+2)}(x-2)}$$

$$= \frac{3x-4}{x-2}$$

$$2. \quad \frac{5x^2-4x-12}{(x-1)(x-2)(x+3)} = \frac{(5x+6)\cancel{(x-2)}}{(x-1)\cancel{(x-2)}(x+3)}$$

$$= \frac{5x+6}{(x-1)(x+3)}$$

x-intercept(s): $(\frac{4}{3}, 0)$

x-intercept(s): $(-\frac{6}{5}, 0)$

y-intercept: $(0, 2)$

y-intercept: $(0, -2)$

horizontal asymptote(s): $y = 3$

horizontal asymptote(s): $y = 0$

vertical asymptote(s): $x = 2$

vertical asymptote(s): $x = 1$ + $x = -3$

oblique asymptote: None

oblique asymptote: None

hole: $(-2, \frac{5}{2}) \rightarrow \frac{3(-2)-4}{(-2)-2} = \frac{-10}{-4} = \frac{5}{2}$

hole: $(2, \frac{16}{5}) \rightarrow \frac{5(2)+6}{(2-1)(2+3)} = \frac{16}{5}$

$$3. \quad g(x) = \frac{2x^3-21x^2+67x-60}{x^2-5x} = \frac{(x-4)(2x^2-13x+15)}{x^2-5x} = \frac{(x-4)(2x-3)\cancel{(x-5)}}{x(x-5)}$$

Oblique:

$$\begin{array}{r} 2x-11 \\ x^2-5x \overline{) 2x^3-21x^2+67x-60} \\ \underline{-(2x^3-10x^2)} \\ -11x^2+67x \\ \underline{-(-11x^2+55x)} \\ -12x-60 \end{array}$$

$$= \frac{(x-4)(2x-3)}{x}$$

x-intercept(s): $(4, 0)$ + $(\frac{3}{2}, 0)$ y-intercept: None

horizontal asymptote(s): None vertical asymptote(s): $x = 0$

oblique asymptote: $y = 2x - 11$ hole: $(5, \frac{7}{5})$

$$\frac{(5-4)(2(5)-3)}{5} = \frac{7}{5}$$

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