

CHAPTER 11

Rational Expressions and Functions

11.1 Simplifying Rational Expressions

1) A rational expression is simply the quotient of two polynomials.

3)

b) $Y = (X - 3)/(X + 2)$

c) When $X = -2$, Y_1 the calculator reads ERROR.

5)

a) $Y_1 = \frac{(x-3)}{(x+2)}, Y_2 = \frac{(x^2-5x+6)}{(x^2-4)}$

Table results:

X	Y ₁	Y ₂
-3	6	6
0	-1.5	-1.5
5	.28571	.28571
12	.64286	.64286

b) The expressions are not equivalent at $x = 2$ because substitution of 2 for x in both expressions yield different output values.

7)

a) $\frac{4}{5}$

b) $\frac{4y^4 - 5}{y^5}$

c) $\frac{x^2 + x - 1}{(x + 7)(x + 1)}$

9)

a) $-\frac{2}{15}$

b) $\frac{5y + 2}{x^2 y^2}$

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

11) $\frac{2}{x(x + 5)}$

13) $\frac{1}{5}$

15) $\frac{(x-3)(x+6)}{x(x-6)}$

17)

- a) $x = 10,000$
- b) $x = 0.001$
- c) $x = 100,000$

19)

- a) $f(x) = 25(4)^{3x}$ is an exponential growth function.
- b) Initial value = $f(0) = 25(4)^{3(0)} = 25(4)^0 = 25(1) = 25$
- c) $x = \frac{1}{3}$