Lecture 18 Practice - Introduction to MathCAD

Entering/Editing Mathematical Expressions

(a) Enter the following: k e^(-alpha (Delta t)^2) [sin(n pi x/L_0) + cos(2 n pi x/L_0)]

$$ke^{-\alpha \cdot \Delta t^2}\left(\sin\left(\frac{n \cdot \pi \cdot x}{L_0}\right)+\cos\left(\frac{2 \cdot n \cdot \pi \cdot x}{L_0}\right)\right)$$

Using Variables

(b) Define the variables a=5, b=3, c=1 and evaluate ((a-b)^2+c)/(a+c) to 5 decimals of precision.

$$a := 5$$
$$b := 3$$
$$c := 1$$
$$\frac{(a-b)^2+c}{a+c} = 0.83333$$

(c) In an industrial process, you are compressing 2 lbmol of nitrogen. The temperature and volume before the compression are 500 R and 600 ft^3 respectively. After the compression, the temperature and volume are 600 R and 400 ft^3 respectively. What is the change in pressure if nitrogen can be assumed to be an ideal gas? *Note: Rg = 10.73 ft^3 psia lbmol^-1 R^-1.*

$$R_g := 10.73 \qquad n := 2$$

$$v_1 := 600 \qquad T_1 := 500 \qquad P_1 := \frac{n \cdot R_g \cdot T_1}{v_1} \qquad P_1 = 17.883$$

$$v_2 := 400 \qquad T_2 := 600 \qquad P_2 := \frac{n \cdot R_g \cdot T_2}{v_2} \qquad \Delta P := P_2 - P_1 = 14.307$$

Symbolic Expressions

(d) Simplify: (x^3+4*x^2-7*x-10)/(x^2-x-2)

$$\frac{x^3+4 \cdot x^2-7 \cdot x-10}{x^2-x-2} \xrightarrow{simplify} x+5$$