Review Worksheet– Key Algebra from 7A necessary for Calculus
See Assignment Sheet and review as needed.

Factoring with negative exponents and complex fractions:
(1) Factor:

Sample: $4x^{-\frac{2}{3}} - 8x^{\frac{1}{3}}$

Homework (a) $12x^{-\frac{3}{4}} - 8x^{\frac{1}{4}}$ (b) $-\frac{1}{2}(3x)(1-x^2)^{-\frac{3}{2}}(-2x) + 3(1-x^2)^{-\frac{1}{2}}$

(2) Simplify:

Sample: $\dfrac{2\sqrt{1+x} - \dfrac{x}{\sqrt{1+x}}}{1+x}$

Homework (a) $\dfrac{x^{-1} + y^{-2}}{x^{-2} - y^{-1}}$ (b) $\dfrac{x(8x-1)\left(x^2+5\right)^{-\frac{1}{2}} - 8\left(x^2+5\right)^{\frac{1}{2}}}{(8x-1)^2}$

(3) Nonlinear Inequalities / Sign Charts
Sample: Solve $x^2 - x < 6$

Homework: (a) Solve $\dfrac{x-2}{x^2-16} \geq 0$ (b) Find the domain $f(x) = \sqrt{3x^2 - 6x}$

(4) Graphing with Absolute Values and Piecewise defined functions. "Removing the bars" on absolute value functions.

Sample: (a) Graph $f(x) = \dfrac{|x|}{x}$ by first writing it as a piecewise defined function without absolute value bars.
(b) Rewrite the function $f(x) = |1-4x|$ as a piecewise function with no bars.

Homework
(a) Graph $f(x) = x - |x|$ by first writing it as a piecewise defined function without absolute value bars.
(b) Rewrite the function $f(x) = |2x+3|$ as a piecewise function with no bars.

(5) Graphing Rational Functions. Review Asymptotes, intercepts etc.

Homework
Graph $f(x) = \dfrac{2x^2 + 7x - 4}{x^2 + x - 2}$

(6) Modeling, applied problems, optimization
Homework The point P lies in the first quadrant on the graph of the line y = 4 - 2x. From the point P, perpendiculars are drawn to both the x-axis and the y-axis. What is the largest possible area for the rectangle thus formed?