# MATH 110 Problem Set 1.6

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The following problems based on Section 1.6 of the textbook will help you study. *You do not need to hand in solutions to these problems.*

1. (Based on 1.6.3–5) Evaluate the following limits, justifying each step by indicating the appropriate limit laws.

   (a) $\lim_{x\to 2} \dfrac{(2x^2+1)}{(x^2+6x-4)}$ (b) $\lim_{t\to -1} (t^2+1)^3(t+3)^5$

2. (Based on 1.6.11–30) Evaluate the following limits if they exist. You do not have to indicate the limit laws used.

   (a) $\lim_{x\to -4} \dfrac{x^2+5x+4}{x^2+3x-4}$ (b) $\lim_{x\to 1} \dfrac{x^3-1}{x^2-1}$ (c) $\lim_{h\to 0} \dfrac{\sqrt{1+h}-1}{h}$ (d) $\lim_{h\to 0} \dfrac{(3+h)^{-1}-3^{-1}}{h}$.

3. (Based on 1.6.40) Show that $\lim_{x\to 0^+} \sqrt{x}[1+\sin^2(2\pi/x)] = 0$.

4. (Based on 1.6.64) Evaluate $\lim_{x\to 2} \dfrac{\sqrt{6-x}-2}{\sqrt{3-x}-1}$.

You may find the following additional exercises from Section 1.6 helpful.

1.6 C-level: 1, 2, 3–9, 10, 11–26, 50, 52;
B-level: 27–30, 31–32, 33–34, 35–40, 47–48, 49, 51;
A-level: 41–46, 53–55, 56–66