Homework Assignment # 2
Due Wednesday, September 5

1. Apostol §1.8, p. 37, Exercise # 13
2. Apostol §1.8, p. 37, Exercise # 15
3. Apostol §1.8, p. 37, Exercise # 18
4. Apostol §1.8, p. 37, Exercise # 20
5. Apostol §1.11, p. 41, Exercise # 5
6. Apostol §1.11, p. 41, Exercise # 8
7. Apostol §1.11, p. 41, Exercise # 9
8. Apostol §1.15, p. 47, Exercise # 3
9. Apostol §1.15, p. 47, Exercise # 4
10. Apostol §1.15, p. 47, Exercise # 6
11. Apostol §1.15, p. 47, Exercise # 7
12. Apostol §1.15, p. 47, Exercise # 10
13. Apostol §1.15, p. 47, Exercise # 15
14. Apostol §1.15, p. 47, Exercise # 17
15. Let $x_1, \ldots, x_n$ be positive real numbers. Define the *arithmetic mean* of $x_1, \ldots, x_n$ to be
$$AM(x_1, \ldots, x_n) = \frac{x_1 + \cdots + x_n}{n},$$
and define the *harmonic mean* of $x_1, \ldots, x_n$ to be
$$HM(x_1, \ldots, x_n) = \frac{n}{\frac{1}{x_1} + \cdots + \frac{1}{x_n}}.$$
Use the Cauchy-Schwarz inequality to show that $HM(x_1, \ldots, x_n) \leq AM(x_1, \ldots, x_n)$, with equality if and only if $x_1 = \cdots = x_n$.