

Homework I

1. [6+12=18 points]

- (a) provide the repeating decimal expansion for the rational number $\frac{6}{7}$, and show how you arrived at your answer.
- (b) Provide the fraction in reduced form whose decimal expansion is $.23434\dots = .2\overline{34}$, and show how you arrived at your answer.

2. [10 points]

Show that $\neg(P \wedge Q)$ is logically equivalent to $\neg P \vee \neg Q$; that is $\neg(P \wedge Q) \Leftrightarrow (\neg P \vee \neg Q)$ is True for all truth values of P and Q.

3. [12 points]

Problem #9, page 70 of text.

4. [15 points]

Problem #3, page 132 of text.

5. [20 points]

Prove by induction that the sum of the first n squares, $1^2+2^2+\dots+n^2$, is $\frac{n(n+1)(2n+1)}{6}$.

That is in summation notation, $\sum_{k=0}^n k^2 = \frac{n(n+1)(2n+1)}{6}$.