

Solutions for Homework Assignment 1

10.2

5. $a_n = \frac{n^2+1}{n}$

6. $a_n = \frac{(-1)^n n}{(n+1)^2}$

29. Increasing. Lower bound = $1/2$. Upper bound = 1 .

30. Decreasing. Lower bound = 0 . Upper bound = $3/10$.

51. $\{1, 4, 9, 16, 25, 36, \dots\}$; $a_n = n^2$

52. $\{1, 3, 7, 15, 31, 63, \dots\}$; $a_n = 2^n - 1$

61. a) $S_n = n$

b) $S_n = \frac{1-r^{n+1}}{1-r}$

62. After partial fractions, $a_n = \frac{1}{n} - \frac{1}{n+1}$.

Therefore, $S_n = 1 - \frac{1}{n+1}$

10.3

5. Converges to 1 .

6. Converges to 1 .

31. e^{2n}

32. $e^{1/2}$

53. Converges to 0 (since $a_n = \frac{1}{n!}$).

54. Converges to 0 (since $a_n = \frac{1}{n}$).