

$$(9) \quad S = \sum_{n=1}^{\infty} \frac{1}{n+1} - \frac{1}{n+2}$$

$$S_3 = \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \frac{1}{4} - \frac{1}{5} = \frac{1}{2} - \frac{1}{5} = \frac{3}{10}$$

$$S_4 = \frac{3}{10} + \frac{1}{5} - \frac{1}{6} = \frac{9}{30} + \frac{6}{30} - \frac{5}{30} = \frac{1}{3}$$

$$S_5 = \frac{1}{3} + \frac{1}{6} - \frac{1}{7} = \frac{14}{42} + \frac{7}{42} - \frac{6}{42} = \frac{15}{42} = \frac{5}{14}$$

$$S_N = \frac{1}{2} - \frac{1}{N+2}$$

$$\lim_{N \rightarrow \infty} S_N = \frac{1}{2}$$

$$N \rightarrow \infty$$

Thursday, March 7, 2019 9:35 AM

10

$$\frac{1,5 + \frac{1}{2} (-1)^{n-1}}{n^2 + 1}$$

11

$$\sum_{n=3}^{\infty} \frac{1}{n(n-1)} = \frac{1}{n-1} - \frac{1}{n}$$

$$\frac{1}{n(n-1)} = \frac{A}{n} + \frac{B}{n-1}$$

$$1 = A(n-1) + Bn$$

$$n=1: 1 = B$$

$$n=0: 1 = -A \quad A = -1$$

$$= \left(\frac{1}{2} - \frac{1}{3}\right) + \left(\frac{1}{3} - \frac{1}{4}\right) + \left(\frac{1}{4} - \frac{1}{5}\right) \dots$$

$$\longrightarrow \frac{1}{2}$$

(11)

(E)

(12)

$$\frac{1}{2} (9^{112} + 9^1 + 9^{312} + 9^2)$$

$$\frac{1}{2} (3 + 9 + 27 + 81)$$

$$\frac{1}{2} (120)$$

60

(C)