Extra Examples, 11.2

1. Does the series converge or diverge?

   (a) $\sum \dfrac{k(k+2)}{(k+3)^2}$

   (b) $\sum\limits_{n=1}^{\infty} \dfrac{5}{n^2}$

   (c) $\sum\limits_{n=2}^{\infty} \dfrac{1+3^n}{5^n}$

2. **What's wrong?**

$$
\begin{aligned}
0 \ &= 0 + 0 + 0 + 0 + \cdots \\
&= (1-1) + (1-1) + (1-1) + \cdots \\
&= 1 - 1 + 1 - 1 + 1 - 1 + \cdots \\
&= 1 + (-1+1) + (-1+1) + (-1+1) + \cdots \\
&= 1 + 0 + 0 + 0 + 0 + \cdots
\end{aligned}
$$

   Therefore, $0 = 1$.