Past exam questions:

Consider the sequence $x_i = \dfrac{i+3}{i-2}$, $3 \leq i \leq 100$.

1. Find x_6.

$$x_6 = \frac{6+3}{6-2} = \frac{9}{4}$$

2. Compute $\displaystyle\sum_{i=1}^{3} x_{i+2}$.

$$\sum_{i=1}^{3} x_{i+2} = x_3 + x_4 + x_5 = \frac{3+3}{3-2} + \frac{4+3}{4-2} + \frac{5+3}{3-2} = 6 + \frac{7}{2} + \frac{36}{6} = \frac{73}{6}$$

3. Fill in the two blanks:

$$\sum_{i=1}^{3} x_{i+2} = \sum_{i=8}^{10} x_{i-5}$$

4. Find the exact value of $\displaystyle\sum_{i=3}^{100} \left(\frac{x_i(i-2)-3}{i} \right)$.

$$\begin{aligned}
\sum_{i=3}^{100} \left(\frac{x_i(i-2)-3}{i} \right) &= \sum_{i=3}^{100} \left(\frac{\frac{i+3}{i-2}(i-2)-3}{i} \right) \\
&= \sum_{i=3}^{100} \left(\frac{i+3-3}{i} \right) \\
&= \sum_{i=3}^{100} 1 \\
&= 98
\end{aligned}$$