

## Routh's Test

$$\begin{array}{l} s^n : \quad 1 \quad a_2 \quad a_4 \quad a_6 \quad \dots \\ s^{n-1} : \quad a_1 \quad a_3 \quad a_5 \quad a_7 \quad \dots \\ s^{n-2} : \quad b_1 \quad b_2 \quad b_3 \quad \dots \end{array}$$

Next, we form the third row marked by  $s^{n-2}$ :

$$s^{n-2} : \quad b_1 \quad b_2 \quad b_3 \quad \dots$$

$$\text{where } b_1 = -\frac{1}{a_1} \det \begin{pmatrix} 1 & a_2 \\ a_1 & a_3 \end{pmatrix} = -\frac{1}{a_1} (a_3 - a_1 a_2)$$

$$b_2 = -\frac{1}{a_1} \det \begin{pmatrix} 1 & a_4 \\ a_1 & a_5 \end{pmatrix} = -\frac{1}{a_1} (a_5 - a_1 a_4)$$

$$b_3 = -\frac{1}{a_1} \det \begin{pmatrix} 1 & a_6 \\ a_1 & a_7 \end{pmatrix} = -\frac{1}{a_1} (a_7 - a_1 a_6) \quad \text{and so on ...}$$

**Note:** the new row is 1 element shorter than the one above it