

Week 7/8 Worksheet Hints

Hint for Q3.2 & Q3.3

$$\begin{aligned} \det \begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix} &= \det \begin{bmatrix} 1 & a & a^2 \\ 0 & b-a & b^2-a^2 \\ 0 & c-a & c^2-a^2 \end{bmatrix} \\ &\quad \begin{matrix} R_2 \rightarrow -R_1 + R_2 \\ R_3 \rightarrow -R_1 + R_3 \end{matrix} \\ &= 1 \cdot \det \begin{bmatrix} b-a & b^2-a^2 \\ c-a & c^2-a^2 \end{bmatrix} \\ &= 1 \cdot \det \begin{bmatrix} b-a & (b-a)(b+a) \\ c-a & (c-a)(c+a) \end{bmatrix} \\ &= 1 \cdot (b-a) \det \begin{bmatrix} 1 & b+a \\ c-a & (c-a)(c+a) \end{bmatrix} \\ &= 1 \cdot (b-a)(c-a) \cdot \det \begin{bmatrix} \text{fill in} \\ \end{bmatrix} \\ &= (b-a)(c-a) \cdot \underline{\quad? \quad} \end{aligned}$$

Hint for Q4.3

If you get $\left[\begin{array}{ccc|c} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right]$ then column 1 (and 2 and 3)

has no leading 1s, so you need to set each variable to a parameter

(say, $x=r$, $y=s$, $z=t$).