Proof of Lmm 38

$$\det(B-\lambda I) = \det(PAP^{-1} - \lambda I)$$
$$= \det(PAP^{-1} - P(\lambda I)P^{-1}) \quad \leftarrow P I P^{-1} = I$$

(∵ matrix in the middle is λI bcz it is commutative)

$$= \det(P(A-\lambda I)P^{-1})$$
$$= \det(P)\det(A-\lambda I)\det(P^{-1}) \quad \text{(multiplicative property)}$$
$$= \det(A-\lambda I)$$