

In-Class Worksheet
March 6, 2015

$Q = \textcircled{\alpha}$ (type A_1), $\Delta = \Phi^+ = \{\alpha\}$.	dim. vector $\mathbf{d}$ $\mathbf{d}(\alpha)$ n	dim. of $\text{Rep}_{\mathbf{d}}(Q)$ 0	orbit/module $\mathbf{n}$ $\mathbf{n}(\alpha)$ n	rep. of Q k^n	dim $\mathcal{O}_{\mathbf{n}}$ 0	$[M(\mathbf{n})]$ $E_{\alpha}^{(n)}$	$B_{\mathbf{n}}$ $E_{\alpha}^{(n)}$
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$Q = \textcircled{\alpha} \longrightarrow \textcircled{\beta}$ (type A_2), $\Delta = \{\alpha, \beta\}$, $\Phi^+ = \{\alpha, \beta, \alpha + \beta\}$. Order on Φ^+ : $\beta < \alpha + \beta < \alpha$.

dim. vector $\mathbf{d}$ $\mathbf{d}(\alpha)$ $\mathbf{d}(\beta)$	dim. of $\text{Rep}_{\mathbf{d}}(Q)$	orbit/module $\mathbf{n}$ $\mathbf{n}(\beta)$ $\mathbf{n}(\alpha + \beta)$ $\mathbf{n}(\alpha)$			rep. of Q	dim $\mathcal{O}_{\mathbf{n}}$	$[M(\mathbf{n})]$	$B_{\mathbf{n}}$
1 0	0	0	0	1	$k \rightarrow 0$	0	E_{α}	E_{α}
0 1	0	1	0	0	$0 \rightarrow k$	0	E_{β}	E_{β}

2 0	0	0	0	2	$k^2 \rightarrow 0$	0	$E_{\alpha}^{(2)}$	$E_{\alpha}^{(2)}$
1 1	1	1	0	1	$k \xrightarrow{0} k$	0		
			0	0	$k \xrightarrow{\sim} k$	1		
0 2	0	2	0	0	$0 \rightarrow k^2$	0	$E_{\beta}^{(2)}$	$E_{\beta}^{(2)}$

3 0	0	0	0	3	$k^3 \rightarrow 0$	0	$E_{\alpha}^{(3)}$	$E_{\alpha}^{(3)}$
2 1	2	1	0	2	$k^2 \xrightarrow{0} k$	0		
			0	1	$k^2 \xrightarrow{\text{surj.}} k$	2		
1 2	2	2	0	1	$k \xrightarrow{0} k^2$	0		
			1	0	$k \xrightarrow{\text{inj.}} k^2$	2		
0 3	0	0	0	3	$k^3 \rightarrow 0$	0	$E_{\alpha}^{(3)}$	$E_{\alpha}^{(3)}$

dim. vector $\mathbf{d}$ $\mathbf{d}(\alpha)$ $\mathbf{d}(\beta)$	dim. of $\text{Rep}_{\mathbf{d}}(Q)$	orbit/module $\mathbf{n}$ $\mathbf{n}(\beta)$ $\mathbf{n}(\alpha + \beta)$ $\mathbf{n}(\alpha)$			rep. of Q	dim $\mathcal{O}_{\mathbf{n}}$	$[M(\mathbf{n})]$	$B_{\mathbf{n}}$
4 0	0	0	0	4	$k^4 \rightarrow 0$	0	$E_{\alpha}^{(4)}$	$E_{\alpha}^{(4)}$
3 1								
2 2								
1 3								
0 4	0	4	0	0	$0 \rightarrow 4$	0	$E_{\beta}^{(4)}$	$E_{\beta}^{(4)}$