E8

```
R = RootSystem("F4"); R
```

Root system of type ['F', 4]

```
L = R.ambient_space(); L
```

Ambient space of the Root system of type ['F', 4]

```
[L.simple_root(i) for i in [1,2,3,4]]
```

$$\left[e_1 - e_2, e_2 - e_3, e_3, \frac{1}{2}e_0 - \frac{1}{2}e_1 - \frac{1}{2}e_2 - \frac{1}{2}e_3\right]$$

```
DynkinDiagram("B3")
```

```
O---O=>=O
1   2   3
B3
```

```
B3 = WeylCharacterRing("B3"); B3
```

The Weyl Character Ring of Type B3 with Integer Ring coefficients

```
L = B3.space(); L
```

Ambient space of the Root system of type ['B', 3]

```
[fw1,fw2,fw3] = [L.fundamental_weights()[i] for i in [1,2,3]]
```

```
[chi1,chi2,chi3] = [B3(x) for x in [fw1,fw2,fw3]]
```

```
fw1, chi1, chi1.degree()
```

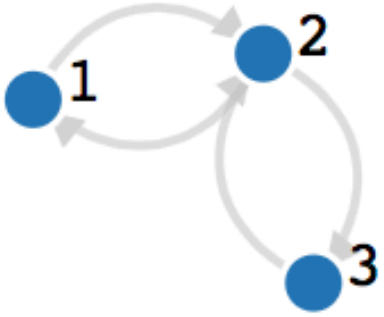
$$\left(e_0, B_{e_0}, 7\right)$$

```
fw3, chi3, chi3.degree()
```

$$\left(\frac{1}{2}e_0 + \frac{1}{2}e_1 + \frac{1}{2}e_2, B_{\frac{1}{2}e_0+\frac{1}{2}e_1+\frac{1}{2}e_2}, 8\right)$$

```

```


1
2
3