Problem: Find the number of different ways to color a cube such that
2 faces are blue, 2 faces are red and 2 faces are green.

First we define the cycle index of the octahedron:

```
> psi:=(x1,x2,x3,x4,x5,x6)->(x1^6+6*x1^2*x4+3*x1^2*x2^2+6*x2^3+8*x3^
  2)/24;
```

$$\psi := (x1, x2, x3, x4, x5, x6) \rightarrow \frac{1}{24}\, x1^6 + \frac{1}{4}\, x1^2\, x4 + \frac{1}{8}\, x1^2\, x2^2 + \frac{1}{4}\, x2^3 + \frac{1}{3}\, x3^2$$

Then we define the variable substitution....

```
> s:=k->g^k+r^k+b^k;
```

$$s := k \rightarrow g^k + r^k + b^k$$

...and perform it on the cycle index:

```
> p:=psi(s(1),s(2),s(3),s(4),s(5),s(6));
```

$$p := \frac{1}{24}\,(g+r+b)^6 + \frac{1}{4}\,(g+r+b)^2\,(g^4+r^4+b^4) + \frac{1}{8}\,(g+r+b)^2\,(g^2+r^2+b^2)^2 + \frac{1}{4}\,(g^2+r^2+b^2)^3 + \frac{1}{3}\,(g^3+r^3+b^3)^2$$

Finally we ask for the coefficient of g^2 r^2 b^2:

```
> coeff(coeff(coeff(p,g^2),b^2),r^2);
```

$$6$$

```
> expand(p);
```

$$2\,g\,r\,b^4 + 2\,g\,r^4\,b + g^6 + r^6 + b^6 + g\,r^5 + g\,b^5 + 2\,g^2\,r^4 + 2\,g^2\,b^4 + g^5\,r + g^5\,b + 2\,g^4\,r^2 + 2\,g^4\,b^2 + 2\,g^3\,r^3 + 2\,g^3\,b^3 + r\,b^5 + 2\,r^2\,b^4 + r^5\,b + 2\,r^4\,b^2 + 2\,r^3\,b^3 + 2\,g^4\,r\,b + 3\,g^3\,r^2\,b + 3\,g^3\,r\,b^2 + 3\,g^2\,r^3\,b + 6\,g^2\,r^2\,b^2 + 3\,g^2\,r\,b^3 + 3\,g\,r^3\,b^2 + 3\,g\,r^2\,b^3$$