```
> restart;
> n:=6;
```

$$n := 6 \tag{1}$$

```
> h:=1/n;
```

$$h := \frac{1}{6} \tag{2}$$

```
> approx:=sum(w[k]*f(k*h),k=0..n);
```

$$approx := w_0 f(0) + w_1 f\left(\frac{1}{6}\right) + w_2 f\left(\frac{1}{3}\right) + w_3 f\left(\frac{1}{2}\right) + w_4 f\left(\frac{2}{3}\right) + w_5 f\left(\frac{5}{6}\right) + w_6 f(1) \tag{3}$$

```
> eq:=int(f(x),x=0..1)=approx;
```

$$eq := \int_0^1 f(x)\,dx = w_0 f(0) + w_1 f\left(\frac{1}{6}\right) + w_2 f\left(\frac{1}{3}\right) + w_3 f\left(\frac{1}{2}\right) + w_4 f\left(\frac{2}{3}\right) + w_5 f\left(\frac{5}{6}\right) + w_6 f(1) \tag{4}$$

```
> eqf:=unapply(eq,f);
```

$$eqf := f \to \int_0^1 f(x)\,dx = w_0 f(0) + w_1 f\left(\frac{1}{6}\right) + w_2 f\left(\frac{1}{3}\right) + w_3 f\left(\frac{1}{2}\right) + w_4 f\left(\frac{2}{3}\right) + w_5 f\left(\frac{5}{6}\right) + w_6 f(1) \tag{5}$$

```
> eqs:={seq(eqf(x->x^k),k=0..n)};
```

$$eqs := \left\{1 = w_0 + w_1 + w_2 + w_3 + w_4 + w_5 + w_6,\ \frac{1}{2} = \frac{1}{6} w_1 + \frac{1}{3} w_2 + \frac{1}{2} w_3 + \frac{2}{3} w_4 + \frac{5}{6} w_5 + w_6,\ \frac{1}{3} = \frac{1}{36} w_1 + \frac{1}{9} w_2 + \frac{1}{4} w_3 + \frac{4}{9} w_4 + \frac{25}{36} w_5 + w_6,\ \frac{1}{4} = \frac{1}{216} w_1 + \frac{1}{27} w_2 + \frac{1}{8} w_3 + \frac{8}{27} w_4 + \frac{125}{216} w_5 + w_6,\ \frac{1}{5} = \frac{1}{1296} w_1 + \frac{1}{81} w_2 + \frac{1}{16} w_3 + \frac{16}{81} w_4 + \frac{625}{1296} w_5 + w_6,\ \frac{1}{6} = \frac{1}{7776} w_1 + \frac{1}{243} w_2 + \frac{1}{32} w_3 + \frac{32}{243} w_4 + \frac{3125}{7776} w_5 + w_6,\ \frac{1}{7} = \frac{1}{46656} w_1 + \frac{1}{729} w_2 + \frac{1}{64} w_3 + \frac{64}{729} w_4 + \frac{15625}{46656} w_5 + w_6\right\} \tag{6}$$

```
> vbls:={seq(w[k],k=0..n)};
```

$$vbls := \{w_0, w_1, w_2, w_3, w_4, w_5, w_6\} \tag{7}$$

```
> solve(eqs,vbls);
```

$$\left\{w_0 = \frac{41}{840}, w_1 = \frac{9}{35}, w_2 = \frac{9}{280}, w_3 = \frac{34}{105}, w_4 = \frac{9}{280}, w_5 = \frac{9}{35}, w_6 = \frac{41}{840}\right\} \tag{8}$$