

### Additional Problem

1. Suppose  $f(x) = c_3x^3 + c_2x^2 + c_1x + c_0$  (i.e. any cubic function). Show that  $S_2$  gives the exact value of  $\int_0^2 f(x) dx$ .

**Note:** The exact same argument works for  $\int_a^b f(x) dx$  but the algebra is a little more annoying. You can do the more general one for extra credit if you like.