Problem 5.7# 51

This problem was tricker than I realized when I assigned it. Thanks to Caleb for pointing this out. Here is a hint:

$$\begin{aligned}\frac{2u^2}{u^2+3}\,du &= \int \frac{2u^2+6-6}{u^2+3}\,du = \\ &= \int 2\,du - \int \frac{6}{u^2+3}\,du.\end{aligned}$$

You can check this by giving 2 and $\dfrac{6}{u^2+3}$ a common denominator so you can subtract them.