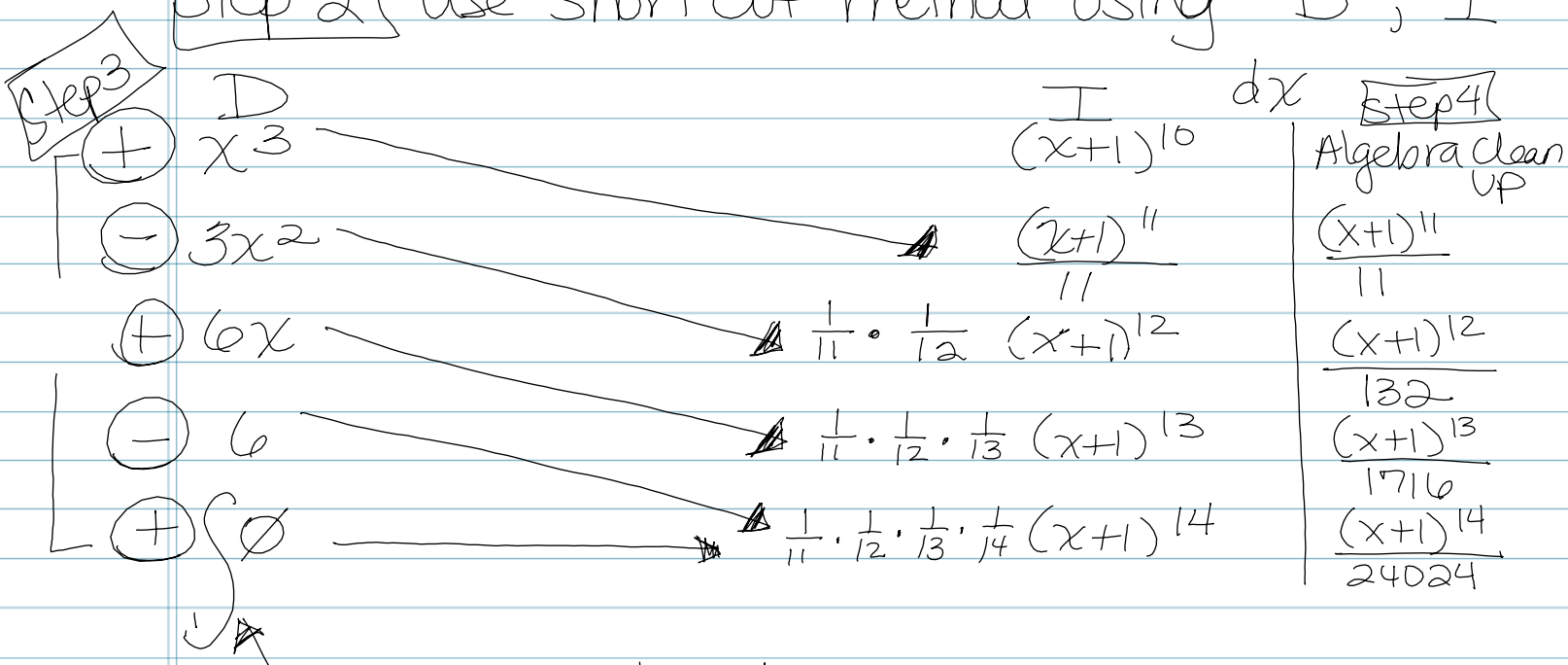


7.1 Review Integration by Parts

#34 $\int_0^1 x^3 (x+1)^{10} dx$

Step 1 Can we use u-substitution? No, b/c if $u = x+1$; $du = dx$; leaves us w/ extra x^3 , so we need to use integration by parts.

Step 2 Use shortcut method using D, I



last piece is integral piece.

Step 5 Put all together

$$x^3 \cdot \frac{1}{11} (x+1)^{11} - (3x^2) \frac{1}{132} (x+1)^{12} + 6x \cdot \frac{1}{1716} (x+1)^{13} - 6 \cdot \frac{1}{24024} (x+1)^{14}$$

= no (+c) b/c $\left. \begin{array}{l} x=1 \\ x=0 \end{array} \right\}$

= $(x+1)^{11} \left[\frac{1}{11} x^3 - (3x^2 \cdot \frac{1}{132} (x+1)) + \frac{6}{1716} x(x+1)^2 - \frac{6}{24024} (x+1)^3 \right] \Big|_0^1 = 117.64$

Common factor $\left[\frac{1}{11} x^3 - (3x^2 \cdot \frac{1}{132} (x+1)) + \frac{6}{1716} x(x+1)^2 - \frac{6}{24024} (x+1)^3 \right]$

