**Peer Questions following Section 6.3**

[Once again, rotate the role of “scribe” in your group. A group member (probably the scribe) must submit your group’s responses to the following questions by 5 pm, Fri., Sept. 13, using the webform below.]

1. **Practice long division of polynomials.** What are equivalent expressions, obtained via long division, for

   \[
   \frac{2x + 5}{3x - 8'}, \quad \frac{2x^2 - 1}{x^2 + 2x + 1'}, \quad \frac{8x^4 + x^2 - 1}{(x - 2)(x^2 + 3)}
   \]

   Under what circumstances is it helpful to carry out long division on a rational function integrand?

2. (You need not submit your answers to these question parts.) Choose an appropriate method, and carry out these integrals.

   (a) \[\int \frac{dt}{t^3 + t}\]

   (b) \[\int \frac{dx}{\sqrt{x^2 - 4x}}\]

   (c) \[\int_0^1 \frac{\sqrt{\arctan r}}{1 + r^2} dr\]

   (d) \[\int \csc^4(3\theta) d\theta\]

   (e) \[\int e^x \cos x \, dx\]

   (f) \[\int \frac{x^2 + 2}{x + 2} \, dx\]