# 7.4 Partial Fractions
# Group Work Target Practice

Work in groups of two or three.

1. For $\dfrac{2}{s^4 - 1}$ write out the factors and the generic forms for the partial fractions and numerators, but **do not solve** for the constants. (Hint: In partial fractions, each linear factor (including any repeated linear terms) gets a constant as the numerator, and each irreducible quadratic gets a linear numerator, so you'll have a sum of terms like $\dfrac{A}{s+1}$)

2. Solve for $\displaystyle\int \dfrac{3x + 11}{x^2 - x - 6}\, dx$ using the method of partial fractions. Show work.

   Factor the denominator into linear and irreducible quadratic terms: $x^2 - x - 6 =$

   Write the generic forms for the partial fractions and numerators:
   $$\frac{3x + 11}{x^2 - x - 6} =$$

   Multiply through by the common denominator and expand:
   $$3x + 11 =$$

   Create equations using like terms:

   $x$ terms:

   constant terms:

   Now you have a linear system of 2 equations and 2 unknowns. Solve this linear system for $A, B$ and show work.

   Write out the integral as the sum of the partial fraction integrals, and then compute it. If you are feeling comfortable with $w$-substitution then in this specific context you do not need to write out the substitution details.
   $$\int \frac{3x + 11}{x^2 - x - 6}\, dx =$$