7. [6 points] Split the function $\dfrac{5x^2 - 7x}{(x-1)^2(x+1)}$ into partial fractions with two or more terms. Do not integrate these terms. Be sure to show all work to obtain your partial fractions.

8. [13 points] Let $f(x)$ be a twice differentiable function with

- $f(0) = 1$.
- $f(\ln 2) = \dfrac{5}{4}$.
- $f'(0) = e$.
- $f'(\ln 2) = 2$.

a. [3 points] Compute the average value of $f'(x)$ on $[0, \ln 2]$.

b. [5 points] Compute the exact value of $\displaystyle\int_0^{\ln 2} x f''(x)\ dx$.

c. [5 points] Compute the exact value of $\displaystyle\int_0^{\ln 2} \dfrac{f'(x)}{\sqrt{9 - (f(x))^2}}\ dx$.