

7. [6 points] Split the function  $\frac{5x^2 - 7x}{(x-1)^2(x+1)}$  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

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

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

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

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