Last Name: _____ First Name: _____ Student-No: _____ Section: _____

Very short answer question

1. [1 mark] Write out the **general form** of the partial-fractions decomposition of $\dfrac{4x^3-3}{(x^2-4)^2(1+2x^2)}$. You need not determine the values of any of the coefficients.

Short answer questions—you must show your work

2. [2 marks] Determine whether the integral $\displaystyle\int_{-2}^{2} \frac{1}{(x+1)^{4/3}}\,dx$ is convergent or divergent. If it is convergent, find its value. Show all your work.

3. [2 marks] Express the x–coordinate of the centroid of the triangle with vertices $(0,-1)$, $(0,1)$, and $(2,0)$ in terms of a definite integral. *Do not evaluate the integral.*

Long answer question—you must show your work

4. [5 marks] Evaluate $\displaystyle\int_0^4 \frac{1}{(4+x^2)^{3/2}}\,dx$. A "calculator-ready" answer is acceptable, but your answer may not contain inverse trigonometric functions.