Problem 1. For each integration problem, without working it out, choose an integration strategy from the following list:

(AIT) Algebra, Identities, Tricks (describe the trick)

(USUB) u Substitution (name what u will be)

(IBP) Integration by Parts (name the u and dv)

(PFD) Partial Fraction Decomposition (factor the denominator if you can)

(TSUB) Trig Substitution (name which trig function to plug in)

Give an explanation for your choice.

(a) $\int \sqrt{x} \ln(x) \, dx$

(b) $\int \dfrac{1}{64 - x^2} \, dx$

(c) $\int x^2 \sin(1 - x) \, dx$

(d) $\int \dfrac{ds}{e^s - 1}$

(e) $\displaystyle \int \frac{x^3 + 4x^2}{x^2 + 4x + 3}\, dx$

(f) $\displaystyle \int \frac{2x + 5}{x^2 + 6x + 10}\, dx$

(g) $\displaystyle \int \frac{3t^2 + t + 4}{t^3 + t}\, dt$

(h) $\displaystyle \int \tan^3(2t)\, dt$

(i) $\displaystyle \int \frac{\cos(\arctan(x))}{\sqrt{1 + x^2}}\, dx$

(j) $\displaystyle \int \frac{6}{(9t^2 + 1)^2}\, dt$