Module 9 self-assessment

Question 1

Using only line integration derive the area of the circle with radius a.

Question 2

Consider two unit circles centred at $(0, 0)$ and $(0, 1)$ respectively. Let us denote the first one by L for 'lower' and the later as H for 'higher'. A path c is formed by the arc of the L circle inside H connected with the arc of H inside L, in anticlockwise direction. Setup two iterated integrals for the flux of $\mathbf{f}(x, y) = 3x^2y\hat{\mathbf{i}} + xy\hat{\mathbf{j}}$ through this c and find their appropriate limits. You do not need to solve it.