

MATH275-002
Twelfth Written Assignment
Due at Class Time
Monday, 29 November

- (1) Use Green's theorem to evaluate

$$\oint_C 3y dx + 5x dy$$

where C is the unit circle $x^2 + y^2 = 1$.

- (2) Use Green's theorem to find the area under one arc of the cycloid

$$x(\theta) = R(\theta - \sin(\theta)), \quad y(\theta) = R(1 - \cos(\theta))$$

- (3) Evaluate

$$\oint_C (x^2 - 2xy + 3y^2)dx + (5x + 1)dy$$

where C is the circle of radius r centered at $(0, b)$

- (4) Find a parametric representation for the upper half of the ellipsoid $4x^2 + 9y^2 + z^2 = 36$
(5) Calculate the fundamental vector product for

$$\mathbf{r}(u, v) = \cos(u) \sin(v)\mathbf{i} + \sin(u) \sin(v)\mathbf{j} + u\mathbf{k}$$