FORENAME:

SURNAME:

STUDENT NO:

12

2018–19 Autumn **MATH115 Basic Mathematics – Homework 6** N. Course

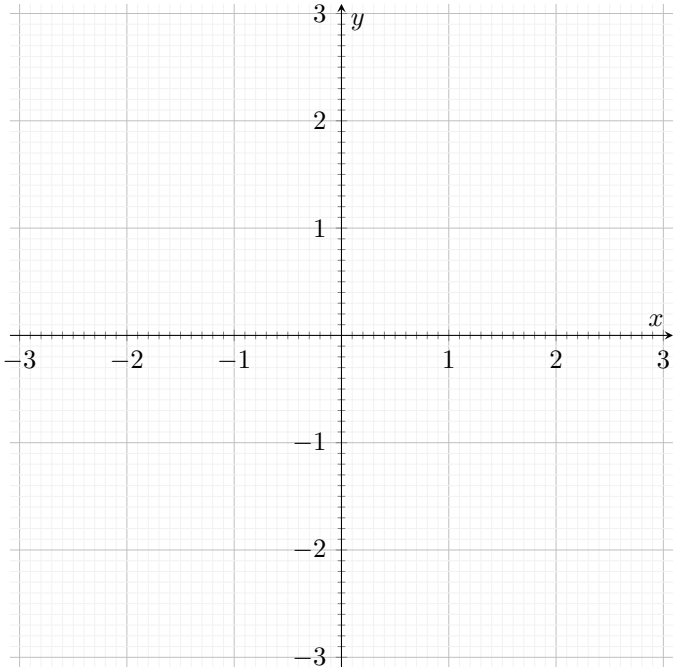
DEADLINE: Tuesday 4 December 2018, 3pm

Exercise 26 (Polar Coordinates).

(a) Find Cartesian coordinates (x, y) for the polar coordinates $(r, \theta) = (\sqrt{8}, 315°)$.

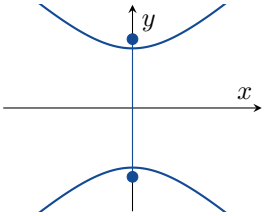
(b) Find polar coordinates (r, θ) for the Cartesian coordinates $(x, y) = (-\frac{\sqrt{27}}{2}, \frac{3}{2})$.

(c) Draw the set of points whose polar coordinates satisfy $1 \leq r \leq 3$ and $45° \leq \theta \leq 180°$.

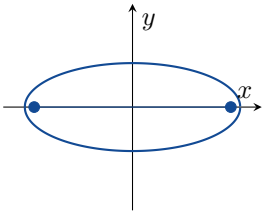


Exercise 27 (Conic Sections).

(a) Find the focus of the hyperbola $\frac{y^2}{48} - x^2 = 1$.



(b) Find the foci of the ellipse $5x^2 + 30y^2 = 150$.



Exercise 28 (Three Dimensional Coordinate Systems). Find the centre and the radius of the sphere

$$8z + 2x^2 + 88 + 2y^2 + 2z^2 = 28y.$$

Exercise 29 (Vectors). Let $\mathbf{a} = 2\mathbf{i} + \mathbf{j}$, $\mathbf{b} = -2\mathbf{i} + 3\mathbf{j}$ and $\mathbf{c} = 2\mathbf{i} - 11\mathbf{j}$.

(a) Find $(5\mathbf{a} - 3\mathbf{b})$.

(b) Find $(2\mathbf{a} + 3\mathbf{b} + \mathbf{c})$ and $\|2\mathbf{a} + 3\mathbf{b} + \mathbf{c}\|$.

Exercise 30 (Vectors). Find a unit vector which points in the same direction as $\mathbf{v} = 32\mathbf{i} + 30\mathbf{j} - 24\mathbf{k}$.

I declare that this assignment is entirely my own work. I did not copy from another student and I did not allow anyone to copy from me. *Bu ödevin tamamen kendi çalışmamın ürünü olduğunu, başka bir öğrencinin ödevini kopyalamadığımı; başkasının da benim çalışmamı kopyalamasına izin vermediğimi beyan ederim.*

SIGNATURE: