2MG04 – TEST 1 – PLANE GEOMETRY September 2020

Name : Pts : / 28 (2 pts *tidiness*) Mark :

Exercise 1. / 3

Answer ONE of the following questions

a) Determine k such that the angle formed by $\vec{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} k \\ 1-2k \end{pmatrix}$ is obtuse.

b) Determine k such that the area of the triangle formed by $\vec{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} k \\ 1-2k \end{pmatrix}$ is equal to 10.

Exercise 2. / 5

The area of the isosceles triangle ABC is 120. We know $A(-2;7)$ and $B(6;1)$.
Give the coordinates of one possible location for the vertex C.

Exercise 3. / 4

a) Give the equation of the line passing through $(1;6)$ that is perpendicular to the line $x + 2y + 6 = 0$.

b) Give the direction vector and a point of the line b: $y = 4x - 1$

Exercise 4. / 4

Give the equation of the smallest circle that passes through the points $A(-4;11)$ and $B(8;6)$.

Exercise 5. / 4

We consider the line a : $12x - 5y + 5 = 0$ and the point $M(4;-7)$.
Determine the radius of the circle centered at M and tangent to the line a.

Exercise 6. / 6

a) Determine the center and radius of the circle c: $(x+3)^2 + y^2 - 4y - 21 = 0$.
b) Determine $a < 0$ such that $A(a;-1)$ is on the circle.
c) The point $B(1;5)$ belongs to the circle. Give the equation of the tangent to the circle that passes through B.