ANALYTIC GEOMETRY AND TRIGONOMETRY

4° ESO

Exercise 1: (2 ptos)

a) Find the symmetric of the point $A(1,2)$ with respect to the point $P(5,-1)$ $\boxed{A'(9,-4)}$

b) Given the vectors $\vec{u}=(2,3)$, $\vec{v}=(-1,4)$ and $\vec{w}=(7,5)$ write $\vec{w}$ as a linear combination of $\vec{u}$ and $\vec{v}$ $\boxed{\vec{w}=3\vec{u}-\vec{v}}$

Exercise 2: (2.25 ptos)

a) Given the points $P(k+4,3)$, $Q(7,k+3)$ and $R(6k,1)$ find the value of k so that the triangle that they form is isosceles in P $\boxed{k=1}$ $\boxed{k=11/23}$ **(1.5)**

b) Find the value of m so that the triangle formed by the points $A(2,3)$, $B(7,4m)$ and $C(m+2,-2)$ has a right angle in A $\boxed{m=1}$ **(0.75)**

Exercise 3: (0.75 ptos) Given the straight line $r\equiv\begin{cases}x=2+5t\\y=1+2t\end{cases}$ find the **general** equation of:

a) A parallel line r' going through the point $A(4,-3)$ $\boxed{2x-5y-23=0}$

b) A perpendicular line r'' going through the point $B(5,-1)$ $\boxed{5x+2y-23=0}$

Exercise 4: (1 pto) Find the parametric and continuous equations of the straight line given by $r\equiv 2x+7y-9=0$

$$\begin{matrix}P(1,1)\\ \vec{u}=(7,-2)\end{matrix} \rightarrow r\equiv\begin{cases}x=1+7t\\y=1-2t\end{cases} \rightarrow \frac{x-1}{7}=\frac{y-1}{-2}$$

Exercise 5: (1 pto) Given the vectors $\vec{u}=(2,3)$ and $\vec{v}=(-1,4)$ find a third vector $\vec{w}$ so that $\vec{u}\perp\vec{w}$ and $\vec{v}\cdot\vec{w}=33$ $\boxed{\vec{w}=(-9,6)}$

Exercise 6: (1 pto) Find the general equation of the straight line that goes through the points $A(3,-5)$ and $B(2,1)$ $\boxed{6x+y-13=0}$

Exercise 7: (1 pto) If $\cos\alpha = 0.57$ and $\frac{3\pi}{2} < \alpha < 2\pi$ find the values of $\sin\alpha$, $\tan\alpha$ and α

$\sin\alpha = -0.82$ $\tan\alpha = -1.44$ $\alpha = 304.75^\circ$

Exercise 8: (1 pto)

a) Turn $\frac{13\pi}{12}$ rad and $\frac{13\pi}{9}$ rad into degrees

$\frac{13\pi}{12}\text{ rad} = 195^\circ$ $\frac{13\pi}{9}\text{ rad} = 260^\circ$

b) Turn 75° and 210° into radians

$75^\circ = \frac{5\pi}{12}\text{ rad}$ $210^\circ = \frac{7\pi}{6}\text{ rad}$