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Max min values of a trig expression | Past Paper Question | C3 Edexcel June 2013 Q8(ii)b

Determine the greatest and least values of

$25-(4\cos\theta-2\sin\theta)^2$ and the smallest positive value of θ

Now $25-(4\cos\theta-2\sin\theta)^2 \equiv 25-\left[\sqrt{20}\cos(\theta+26.5650...)^\circ\right]^2$

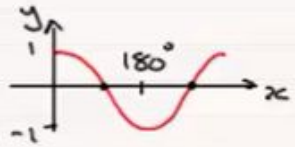
$\equiv 25-20\cos^2(\theta+26.5650...)^\circ$

Max value occurs when $\cos(\quad)=0$

$\therefore$ max value $= 25$, $\quad \theta+26.5650...=90^\circ$

$\therefore \theta = 63.435...^\circ$

$= 63.4^\circ$ (3sf)



Min value occurs when $\cos(\quad)=-1$ or 1

$\therefore$ min value $= 25-20$, $\quad \theta+26.5650..^\circ = 180^\circ \Rightarrow \theta = 153.435...^\circ$

$= 5$ $\quad = 153^\circ$ (3s

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