



Air maths tuition

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## Trig Equations : $A \sin x - B \cos x = C$ Type

Solve  $2\sin\theta - 3\cos\theta = 1$  for  $0^\circ \leq \theta \leq 360^\circ$

Now  $2\sin\theta - 3\cos\theta \equiv R\sin(\theta - \alpha)$

where  $R = \sqrt{2^2 + 3^2}$   
 $= \sqrt{13}$   
 $\alpha = \tan^{-1} \frac{3}{2}$   
 $= 56.309\dots^\circ$

$\therefore \sqrt{13}\sin(\theta - 56.309\dots^\circ) = 1$

$\therefore \theta - 56.309\dots^\circ = \sin^{-1} \frac{1}{\sqrt{13}}$   
 $= 16.102\dots^\circ, 163.897\dots^\circ$

$\therefore \theta = 72.412\dots^\circ, 220.207\dots^\circ$

$\therefore \theta = 72.4^\circ, 220.2^\circ$  (both to 1 d.p.)

$A \sin \theta - B \cos \theta = C$   
 $A \sin \theta - B \cos \theta \equiv R \sin(\theta - \alpha)$   
where  $R = \sqrt{A^2 + B^2}$   
 $\alpha = \tan^{-1} \frac{B}{A}$   
 $A = 2, B = 3$

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