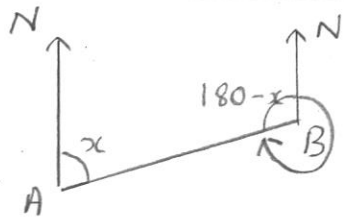
30th May

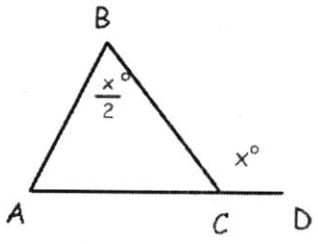
Corbettmaths

The bearing of B from A is x, where x is less than $180°$

Prove the bearing of A from B is $(180 + x)°$



Bearing of A from B
$= 360 - (180 - x) = \underline{(180 + x)°}$



Prove triangle ABC is isosceles

$B\hat{C}A = (180 - x)°$

$B\hat{A}C = 180 - [180 - x + \frac{x}{2}]$

$= 180 - 180 + x - \frac{x}{2}$

$= \frac{x}{2} = C\hat{B}A$

$\Rightarrow \underline{CA = CB}$

The tangent at the point A of the curve $y = 2x^2 - 3x + 3$ is perpendicular to the line $2x + y = 4$

Work out the coordinates of A.

$2x + y = 4 \Rightarrow y = -2x + 4$

$\Rightarrow m = -2$

$\Rightarrow m_{\perp} = \frac{1}{2}$

$\frac{dy}{dx} = 4x - 3$

At A $4x - 3 = \frac{1}{2}$

$\Rightarrow x = \frac{7}{8}$

$\Rightarrow \underline{A\left(\frac{7}{8}, \frac{61}{32}\right)}$

Solve

$4\cos^2 x + 9\sin x = 6$

for $0° < x < 360°$

$4(1 - \sin^2 x) + 9\sin x = 6$

$0 = 4\sin^2 x - 9\sin x + 2$

$0 = (4\sin x - 1)(\sin x - 2)$

$\sin x = \frac{1}{4}$ or 2 (rejected)

$\underline{x = 14.5°, 165.5°}$