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A LEVEL MATHS

(29) Secant, Cosecant and Cotangent Ratios in Trig

WORKING AT D/E

(1) Complete the following sentences:

(a) If $\sin x = \frac{1}{2}$, then $\operatorname{cosec} x =$_____

(b) If $\cos x = \frac{1}{\sqrt{2}}$, then $\sec x =$_____

(c) If $\tan x = \sqrt{3}$, then $\cot x =$_____

(d) If $\sin x = -0.1$, then $\operatorname{cosec} x =$_____

(2) Without a calculator find the value of $\operatorname{cosec}(60^0)$ in the form $p\sqrt{3}$ where p is a rational fraction.

(3) Without a calculator, find the value of $\cot(-45^o)$

WORKING AT B/C

(1) Given that $3\sin x = -4\cos x$,

(a) Find the value of $\tan x$

(b) Hence write down the value of $\cot x$

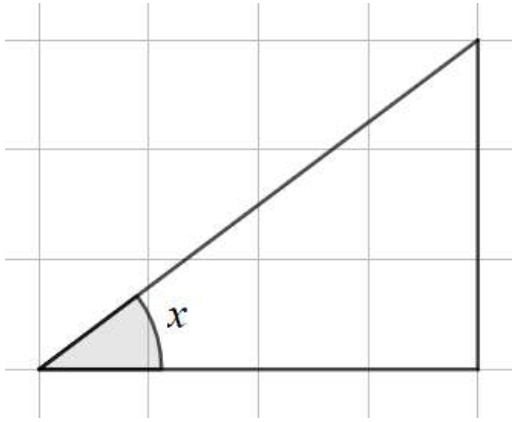
(c) Explain why x cannot be an acute angle.

(2) Without a calculator, find the value of $\frac{\sin\frac{\pi}{3}}{\cot\frac{\pi}{3}}$

(3) Given that $\operatorname{cosec}\theta \equiv \frac{1}{\sin\theta}$, explain why $\operatorname{cosec} 180^o$ is undefined.

WORKING AT A*/A

(1) A right-angle triangle is shown on a grid below



(a) Write down the value of $\sec x$

(b) Write down the value of $\cot x$

(c) Write down the value of $\operatorname{cosec} x$

(d) Verify that $\frac{\cos x}{\text{si}} \equiv \cot x$

(2) Simplify the expression $\sec(2\pi - x)$

(3) Find all the values of x for $0 \leq x \leq 2\pi$ where $\cot x$ is undefined giving a justification for your answers.