

chapter

5

Trigonometry 2

Section 5.5 Inverse trigonometric functions

PROJECT MATHS – STRAND 2
Text & Tests 4
 LEAVING CERTIFICATE
 HIGHER LEVEL

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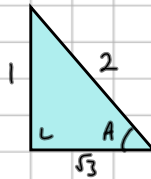
Example 1

Write down the value of each of the following angles in the range 0° to 90° .

- (i) $\sin^{-1}\left(\frac{1}{2}\right)$ (ii) $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$ (iii) $\tan^{-1}(\sqrt{3})$ (iv) $\cos^{-1}(0.8)$.

angle

*these
are
angles*



- (i) $\sin^{-1}\left(\frac{1}{2}\right) = 30^\circ$
 (ii) $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right) = 45^\circ$
 (iii) $\tan^{-1}(\sqrt{3}) = 60^\circ$
 (iv) $\cos^{-1}(0.8) = 36.86^\circ$

use calculator

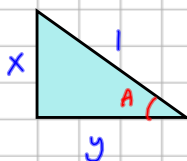
Example 2

(i) Express $\cos(\sin^{-1} x)$ in terms of x .

(ii) Evaluate $\sin(2 \tan^{-1} \frac{4}{3})$.

SoH CAH TOA

let $\sin^{-1} x = A$



Pythagoras

$$1^2 = x^2 + y^2$$

$$\Rightarrow y = \sqrt{1-x^2}$$

cos A ?

$$\cos A = \frac{\sqrt{1-x^2}}{1} = \sqrt{1-x^2}$$

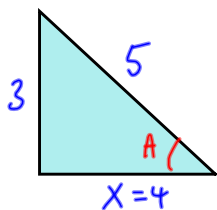
Calculator:

$$\sin(2 \tan^{-1} \frac{4}{3}) = \frac{24}{25}$$

2. In each of the following, draw a triangle to show that

(i) $\sin^{-1}(\frac{3}{5}) = \tan^{-1}(\frac{3}{4})$

let $\sin^{-1}(\frac{3}{5}) = A$



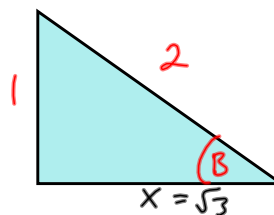
SoH
CAH
TOA

Pythagoras $\Rightarrow x = 4$

$\tan A = \frac{3}{4}$ ✓

(ii) $\sin^{-1}(\frac{1}{2}) = \cos^{-1}(\frac{\sqrt{3}}{2})$

let $\sin^{-1}(\frac{1}{2}) = B$



SoH
CAH
TOA

Pythagoras: $2^2 = x^2 + 1^2$
 $4 = x^2 + 1$
 $3 = x^2$
 $x = \sqrt{3}$

$\cos B = \frac{\sqrt{3}}{2}$ ✓