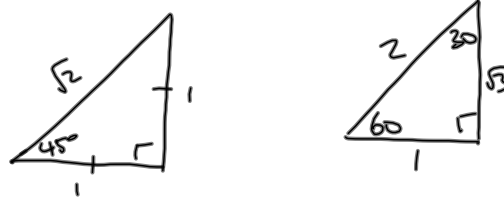


Chapter **5** **Trigonometry 2**

Section 5.5 Inverse trigonometric functions



A: Degrees	30°	45°	60°
A: Rads	$\pi/6$	$\pi/4$	$\pi/3$
sin A	$1/2$	$1/\sqrt{2}$	$\sqrt{3}/2$
cos A	$\sqrt{3}/2$	$1/\sqrt{2}$	$1/2$
tan A	$1/\sqrt{3}$	1	$\sqrt{3}$

P.B

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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) $\cos^{-1}(0.8)$.

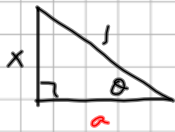
ANGLE

(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)	$\cos^{-1}(0.8) = 36.9^\circ$

Example 2

- (i) Express $\cos(\sin^{-1} x)$ in terms of x . (ii) Evaluate $\sin(2 \tan^{-1} \frac{4}{3})$.

(i)



$$\begin{aligned} 1^2 &= x^2 + a^2 \\ 1 - x^2 &= a^2 \\ a &= \sqrt{1 - x^2} \end{aligned}$$

$$\text{let } \theta = \sin^{-1} x$$

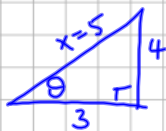
$$\sin \theta = x = \frac{x}{1}$$

$$\cos(\sin^{-1} x) = \cos \theta = \frac{\sqrt{1-x^2}}{1} = \sqrt{1-x^2}$$

(ii)

$$\text{let } 2 \tan^{-1} \frac{4}{3} = 2\theta$$

$$\Rightarrow \theta = \tan^{-1} \frac{4}{3}$$



$$x^2 = 4^2 + 3^2 = 25 \Rightarrow x = 5$$

$$\sin \theta = \frac{4}{5} \quad \cos \theta = \frac{3}{5}$$

$$\sin\left(2 \tan^{-1} \frac{4}{3}\right) = \sin 2\theta^*$$

$$\text{*write in terms of } \theta \text{ p.13 } \boxed{\sin 2\theta = 2 \cos \theta \sin \theta}$$

$$\begin{aligned} \Rightarrow \sin(2\theta) &= 2 \left(\frac{3}{5}\right) \left(\frac{4}{5}\right) \\ &= \frac{36}{25} \end{aligned}$$