

Worksheet 2

Solving trigonometric equations (using calculators)

1. Determine the general solution of each trigonometric equation.

1.1 $4 \sin(\theta - 20^\circ) = -1,243$

1.2 $2 \tan(2\alpha + 10^\circ) - 1$

1.3 $3 \cos 2\alpha = 2,244$

1.4 $\sin(2\theta + 25^\circ) =$

1.5 $\tan^2 x = 1,2$

1.6 $\sin \beta = 2 \cos \beta$

1.7 $4 \cos^2 x + 2 \cos x \sin x - 1 =$

1.8 $\sin(x + 20^\circ) = \cos$

1.9 $\sin(2x - 30^\circ) = \cos(x + 20^\circ)$

1.10 $4 - 4 \cos^2 \theta = 4 \sin$

2. Solve $2 \cos^2 \theta - \cos \theta = 1$ for $\theta \in [-90^\circ; 270^\circ]$.

3. Consider the equation $1 + 2 \sin \alpha \cdot \cos \alpha - 4 \sin^2 \alpha = 0$.

3.1 Show that $1 + 2 \sin \alpha \cdot \cos \alpha - 4 \sin^2 \alpha = (\cos \alpha + 3 \sin \alpha)(\cos \alpha - \sin \alpha)$.

3.2 Hence find the general solution of $1 + 2 \sin \alpha \cdot \cos \alpha - 4 \sin^2 \alpha = 0$ correct to 1 decimal place, where necessary.

3.3 Now find values of α if $-180^\circ \leq \alpha \leq 180^\circ$.

4. Solve for x in:

4.1 $5 \tan^2 x + 7 \tan x = 6$ and $x \in [-180^\circ; 360^\circ]$

4.2 $2 \sin x \cos x - \cos^2 x - 2 \sin x + \cos x = 0$ and $x \in [-180^\circ; 180^\circ]$.