Mathematics for Science

Assignment 8

Trigonometric equations and solving triangles

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Instructions: Attempt all the Questions

1. Solve the following equations for $0^o \leq \theta \leq 360^o$

   a) $\sin\theta = -1$

   b) $\tan 3\theta = 3.08$

   c) $\cos\theta = \sin 4\theta$

   d) $3\sin\theta = \csc\theta$

   e) $4\cos^2\theta + 5\cos\theta + 1 = 0$

   f) $\tan^2\theta - 3\sec\theta + 3 = 0$

   g) $\sin^2(3\theta + 10^o) = 0.6$

   h) $2\cot^2\theta - 5\cot\theta + 2 = 0$

2. Simplify the following trigonometric expressions

   a) $\cos 30^o - 5\sin 60^o$

   b) $\tan 60^o + 3\sin 60^2 - 4\cos 45^o$

   c) $\sin 45^o + 2\cos 45^o$

   d) $\sin 270^o \cos 225^o + \tan 210^o \tan 30^o$

   e) $\text{cosec}\, 60^o \sec 30^o - \cot 60^o \tan 30^o$

3. Solve the following triangles

   a) $\angle A = 53^o, \angle B = 67^o, b = 5.4$ cm

   b) $\angle B = 40^o, \angle C = 73^o, a = 55$ cm

   c) $\angle B = 38^o, a = 5.4$ cm, $b = 7.6$ cm

   d) $a = 7$ cm, $b = 8$ cm, $c = 5$ cm

   e) $\angle A = 125^o, b = 8$ cm, $c = 5.5$ cm

   f) $\angle C = 142^o, a = 37.2$ cm, $b = 23$ cm