Answer on Question #42394 - Math - Geometry

Find all solutions to the equation

$$7\sin^2 x - 14\sin x + 2 = -5.$$

Solution. First, let us bring all the terms to the right-hand side of the equation:

$$7\sin^2 x - 14\sin x + 7 = 0$$

and divide by 7:

$$\sin^2 x - 2\sin x + 1 = 0.$$

This can be written as

$$(\sin x - 1)^2 = 0,$$

or

$$\sin x - 1 = 0,$$

$$\sin x = 1.$$

Thus,

$$x = \arcsin 1 + 2\pi n, \quad n\epsilon\mathbb{Z},$$

and finally

$$x = \frac{\pi}{2} + 2\pi n, \qquad n\epsilon\mathbb{Z}.$$

Answer. $x = \frac{\pi}{2} + 2\pi n$ for any $n \in \mathbb{Z}$.