



Test in/ Examen de : Mathematics

Name/Le nom : .....

Class/ La Classe: 9<sup>th</sup> Grade

Time / La durée : .....

Date / La date: 2015-2016

Correction Standards for 3<sup>rd</sup> Trial

\* 1<sup>st</sup> - exercise:

$$1) a = \cos \hat{A}, b = \cos \hat{B}, c = \cos \hat{C} \neq \cos 75^\circ = x \text{ (given)}$$

$$\text{And } a^2 + b^2 + c^2 + 2abc = 1 \text{ (given)}$$

$$\text{So, } \cos^2 \hat{A} + \cos^2 \hat{B} + \cos^2 \hat{C} + 2 \cos \hat{A} \cdot \cos \hat{B} \cdot \cos \hat{C} = 1$$

$$\text{but } \hat{A} = 75^\circ, \hat{B} = 45^\circ \text{ \& } \hat{C} = 60^\circ \text{ (given)}$$

$$\text{then } \cos^2 75^\circ + \cos^2 45^\circ + \cos^2 60^\circ + 2(\cos 75^\circ \cdot \cos 45^\circ \cdot \cos 60^\circ) = 1$$

$$\text{but } \cos 75^\circ = x, \cos 45^\circ = \frac{\sqrt{2}}{2}, \cos 60^\circ = \frac{1}{2}$$

$$\text{then } x^2 + \left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{1}{2}\right)^2 + 2(x)\left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right) = 1$$

$$\left(x^2 + \frac{3}{4} + \frac{2\sqrt{2}x}{4} = 1\right) \times 4$$

$$4x^2 + 2\sqrt{2}x = 4 - 3$$

$$\text{Thus, } 4x^2 + 2\sqrt{2}x - 1 = 0.$$

2) a)  $U = \frac{\sqrt{6} - \sqrt{2}}{4}$  is a solution of  $4x^2 + 2x\sqrt{2} - 1 = 0$  if it satisfies it.

$$4\left(\frac{\sqrt{6} - \sqrt{2}}{4}\right)^2 + 2\left(\frac{\sqrt{6} - \sqrt{2}}{4}\right)\sqrt{2} - 1 \stackrel{?}{=} 0$$

$$\frac{4(8 - 4\sqrt{3})}{16} + \frac{2(2\sqrt{3} - 2)}{4} - 1 \stackrel{?}{=} 0$$

$$\frac{16(2 - \sqrt{3})}{16} + \frac{4(\sqrt{3} - 1)}{4} - 1 \stackrel{?}{=} 0$$

$$2 - \sqrt{3} + \sqrt{3} - 1 - 1 \stackrel{?}{=} 0$$

$$0 = 0 \checkmark$$

Thus,  $U = \frac{\sqrt{6} - \sqrt{2}}{4}$  is a root for the given equation.