MATH 11022–006 | Trigonometry | Dr. Kracht

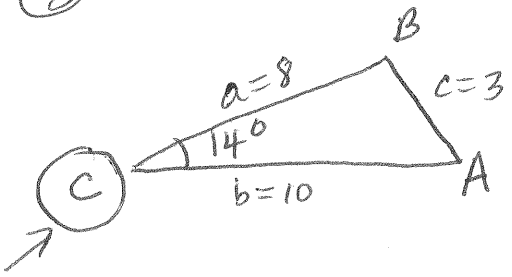
TR 11:00 | Spring 2014

Name: KEY Quiz Score: /20

Quiz 9

Use the Law of Sines or the Law of Cosines **to find angle C (only)**. If two solutions exist, find both. If no solution exists, explain why not. Assume triangles are labeled in the standard way (angle A opposite side a, etc.). Sketch and label a triangle for each solution, roughly to scale. *Round your answers to the nearest degree. Justify your answers.*

(8) 1. $a = 8$, $b = 10$, $c = 3$.



By Law of Cosines:

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$2ab\cos C = a^2 + b^2 - c^2$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$C = \cos^{-1}\left(\frac{a^2 + b^2 - c^2}{2ab}\right)$$

$$= \cos^{-1}\left(\frac{8^2 + 10^2 - 3^2}{2(8)(10)}\right)$$

$$= \cos^{-1}\left(\frac{155}{160}\right) \approx 14^\circ$$

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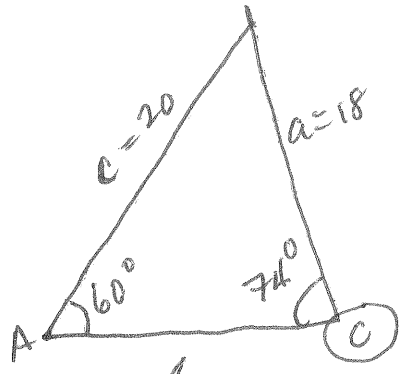
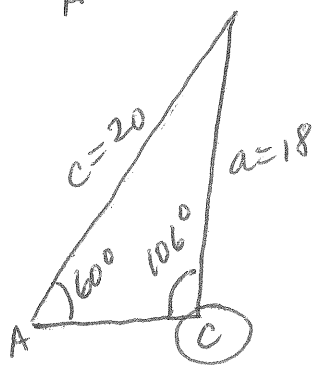
(12) 2. $A = 60°$, $a = 18$, $c = 20$.





By Law of Sines

$$\frac{\sin C}{c} = \frac{\sin A}{a}$$

$$\sin C = \frac{c\sin A}{a}$$

$$\sin C = \frac{20\sin 60^\circ}{18}$$

$$\sin C = \frac{10}{9}\cdot\frac{\sqrt{3}}{2} = \frac{5\sqrt{3}}{9}$$

$$C = \sin^{-1}\left(\frac{5\sqrt{3}}{9}\right) \approx 74^\circ$$

OR

$$C \approx 180^\circ - 74^\circ = 106^\circ$$