Quiz: Question 6

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To find the measure of angle A, we have to use the law of cosines. See the following visualization.

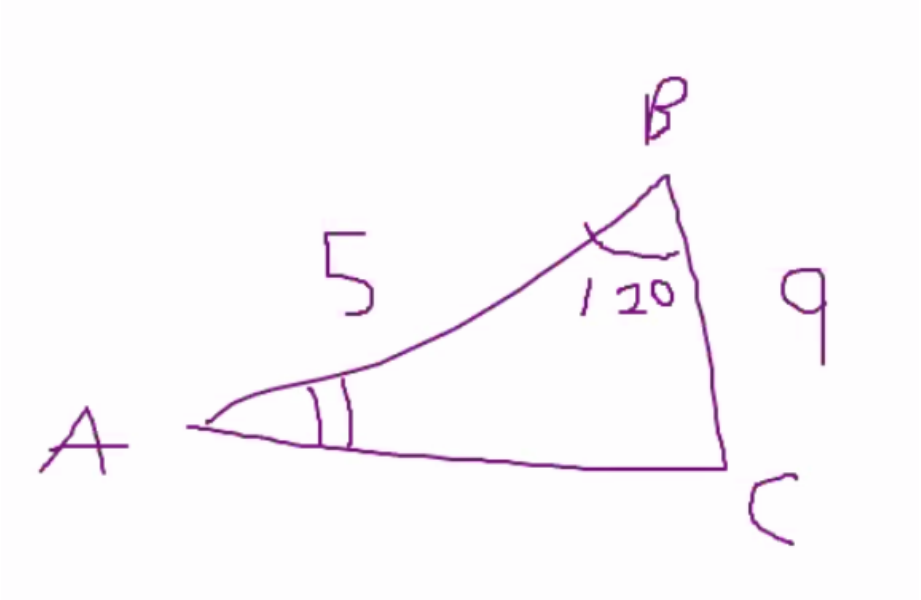

Figure 1: Triangle ABC

$$b^2 = 5^2 + 9^2 - 2(5 * 9 * cos(120)) \tag{1}$$

$$b^2 = 106 - 90cos(120) \tag{2}$$

$$b = \sqrt{106 - 90cos(120)} \approx 12.3 \tag{3}$$

$$9^2 = 5^2 + (12.3)^2 - 2(5)(12.3)cos(A) \tag{4}$$

$$81 = 25 + 151.3 - 123cos(A) \rightarrow 176.3 - 123cos(A) \tag{5}$$

$$cos(A) = -\frac{81 - 176.3}{123} \tag{6}$$

$$A = cos^{-1}(-\frac{81 - 176.3}{123}) \approx 141^\circ \tag{7}$$

Since the angle is across the side which is not the largest, we must subtract this answer from 180° .

$$A = 180 - 141 \tag{8}$$

$$A = 39^\circ \tag{9}$$