Writing Excellence answers to **Equilibrium Expression** questions

Equilibrium Expression QUESTION	
Question: The following chemical equation represents a reaction that is part of the Contact Process, which produces	
sulfuric acid.	
$2SO_{2(g)} + O_{2(g)} \leftrightarrow 2SO_{3(g)}$ $\Delta H = -200 \text{ kJ mol}^{-1}$, Kc= 4.32 at 600°C	
(i) Write an equilibrium constant expression for this reaction.	
(II): A reaction mixture has the following concentration of gases at 600°C:	
$[SO2_{(g)}] = 0.300 \text{ mol } L^{-1}$	
$[SO_{(g)}] = 0.250 \text{ mol } 1^{-1}$	
Justify why this reaction mixture is not at equilibrium, using the equilibrium expression and the data provided	
ANSWER	
1. Write out the equilibrium constant	
expression in full	$2SO_{2(a)} + O_{2(a)} \leftrightarrow 2SO_{3(a)}$
$K_{c} = \left[C \right]^{c} \times \left[D \right]^{d}$	2(9) 2(9) 3(9)
	$\mathbf{V} = [\mathbf{SO}_3]$
Given $\underline{aA} + \underline{bB} \longrightarrow cC + \underline{dD}$	$\Lambda_{c} = \frac{1}{[\Omega_{c}]^{2}[\Omega_{c}]}$
	$[\mathbf{SO}_2] [\mathbf{O}_2]$
2. Calculate the Q value by inserting	
all of the [] data given.	
	0.250^2
Show working and remember order	$Q = \frac{0.250}{2} = 6.94$
of operation and 3sgf	$\sim 0.300^2 \times 0.100$
Final value will have a surit.	
A Write down the Keyalus and	Since $K = 4.22$ $O \neq K$ so this reaction mixture is not at as will below
compare with the O value stating	Since $\kappa_c = 4.32$, $Q \neq \kappa_c$, so this reaction mixture is not at equilibrium.
whether it is equal or not (and	
therefore is or is not at equilibrium)	
. ,	
4. Link the Q value as either being	This number is greater than the K_c value, 4.32, which indicates that the
bigger (and lying to the products side	reaction lies to the products side as the larger the K_c or Q value, the greater the
as the numerator is greater) OR as	numerator (products).
peing smaller (and lying to the	
smaller)	

NOTE: The white column is how your answer would appear on your test paper so make sure you **write out complete sentences**. The grey area is just to help you structure your answer and would not appear in the question.