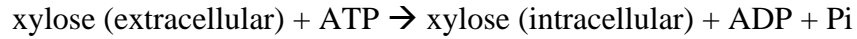


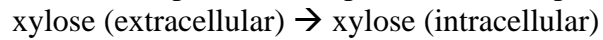
Problem 1

Xylose is metabolized in *E. coli* via two different uptake mechanisms:

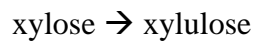
1) an ABC transporter:



2) ATP-independent transport via either a proton symporter or a promiscuous transporter:



Then, intracellular xylose is metabolized to the PP pathway intermediate xylulose-5P by two steps:



A) Write the overall stoichiometric equation for xylose to pyruvate via the ABC transporter.

B) Write the overall stoichiometric equation for xylose to pyruvate via ATP-independent transport.

NOTE: Pyruvate is the only metabolic product