1. Express the statement "Every student in the class has studied calculus" using predicates and quantifiers. Show variables (givens).

S(x) is a student in the class.
C(x) is someone who has studied calculus.

∀x(S(x) → C(x))

2. Using the domain 'students in your school', translate the following into logical expression:
A student in your school knows Java, C++, and Mathlab.

S(x) a student in your school
J(x) a student that knows Java
C(x) a student that knows C++
M(x) a student that knows Mathlab

Either of the following is correct:

∃x(S(x) ∧ J(x) ∧ C(x) ∧ M(x))
∀x S(x) ∃x(J(x) ∧ C(x) ∧ M(x))

3. Using P(x), Q(x), and R(x), express the following argument with the domain consisting of all creatures:

"All frogs hop."
"Some frogs don't fly."
"Some creatures that hop can not fly"

∀x(P(x) → Q(x))
∃x(P(x) ∧ ¬R(x))
∃x(Q(x) ∧ ¬R(x))