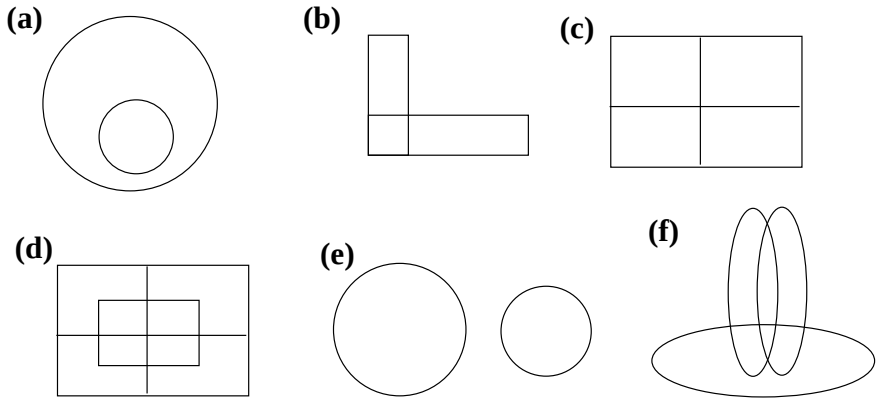
Assignment 2

Translate each of the following four syllogisms into equational arguments.

(1)	All M is P.	$= 0$	(2)	All M is P.	$= 0$
	All S is M.	$= 0$		No S is M.	$= 0$
	All S is P.	$= 0$		No S is P.	$= 0$
(3)	All P is M.	$= 0$	(4)	No M is P.	$= 0$
	No M is S.	$= 0$		All S is M.	$= 0$
	No S is P.	$= 0$		No S is P.	$= 0$



Which of the six diagrams above could qualify as **Venn diagrams**?

Answer: _____

The Expansion Theorem

For the formula $F(A, B) = (AB)'$ carry out the following computations to calculate the expansion of $F(A, B)$ on A, B:

	Full Expression	Value
$F(1,1) =$		$=$
$F(1,0) =$		$=$
$F(0,1) =$		$=$
$F(0,0) =$		$=$

Thus expanding on A, B gives: $F(A, B) =$ _____

For the formula $F(A, B, C) = (AB)' \cup (BC)$ carry out the following computations to calculate the expansion of $F(A, B, C)$ on A:

	Full Expression	Simplified
$F(1, B, C) =$		$=$
$F(0, B, C) =$		$=$

Expanding on A gives: $F(A, B, C) =$ _____

For the formula $F(A, B, C) = (AB)' \cup (BC)$ carry out the following computations to calculate the expansion of $F(A, B, C)$ on B, C:

	Full Expression	Simplified
$F(A, 1, 1) =$		$=$
$F(A, 1, 0) =$		$=$
$F(A, 0, 1) =$		$=$
$F(A, 0, 0) =$		$=$

Expanding on B, C gives: $F(A, B, C) =$ _____

Elimination

For the formula $E(A, B, C) = (A(A' \cup B)'C')'$ carry out the following computations to eliminate A from the equation $E(A, B, C) = 0$:

	Full Expression	Simplified
$E(1, B, C) =$		$=$
$E(0, B, C) =$		$=$

Eliminating A gives (simplify first!): _____ $= 0$

For the formula $E(A, B, C, D) = (A \cup B)(C \cup D)$ carry out the following computations to eliminate B, C from the equation $E(A, B, C, D) = 0$:

	Full Expression	Simplified
$E(A, 1, 1, D) =$		$=$
$E(A, 1, 0, D) =$		$=$
$E(A, 0, 1, D) =$		$=$
$E(A, 0, 0, D) =$		$=$

Eliminating B, C gives (simplify first!): $_____ = 0$

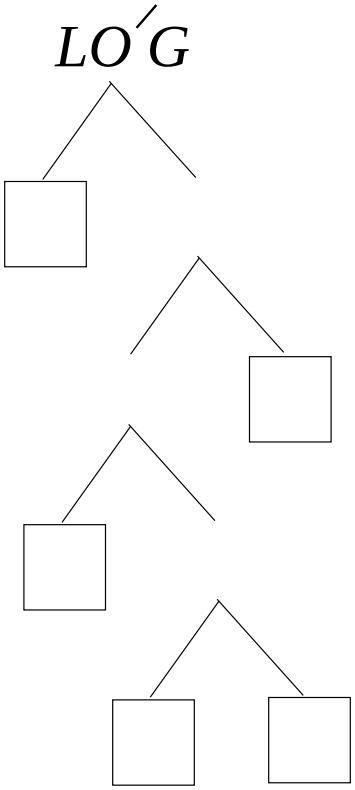
Fill in the following tree to give a proof of the validity of the argument using the method of Lewis Carroll. Be sure to give the number for each boxed letter.

1 $ACL = 0$

2 $A'I'M' = 0$

3 $GIO' = 0$

4 $A'CM = 0$

5 $C'I'O' = 0$

$LO'G = 0$