Homework 1
CMPSC 360

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Question 1:

$[Y \wedge (\neg X \wedge \neg Y)] \vee [X \wedge [(X \wedge Y) \vee (\neg X \wedge Y) \vee (X \wedge \neg Y)]]$
$[(Y \wedge \neg Y) \wedge \neg X] \vee [X \wedge [(X \wedge Y) \vee (\neg X \wedge Y) \vee (X \wedge \neg Y)]]$ Associative Rule
$[F \wedge \neg X] \vee [X \wedge [(X \wedge Y) \vee (\neg X \wedge Y) \vee (X \wedge \neg Y)]]$ Contradiction
$[F \wedge \neg X] \vee [X \wedge [(X \wedge Y) \vee [(\neg X \vee X) \wedge (Y \vee \neg Y)]]]$ Distributive Law
$[F \wedge \neg X] \vee [X \wedge [(X \wedge Y) \vee [T \wedge T]]]$ Tautology
$[F \wedge \neg X] \vee [X \wedge [(X \wedge Y) \vee T]]$ Identity
$F \vee [X \wedge [(X \wedge Y) \vee T]]$ Identity
$F \vee [X \wedge (X \wedge Y)]$ Identity
$F \vee [(X \wedge X) \wedge Y]$ Associative Rule
$F \vee [X \wedge Y]$ Idempotence
$X \wedge Y$ Identity