Family Name:						Student ID:					
Given Name:											
Tutorial:	Wed	Thur	Fri								
	10am	10:30am	11am	11:30am	12:30am	1pm	2pm	2:30pm	3pm	3:30pm	4pm
	4:30pm	5pm									
Tutor:	Cahit	Jerry	Jie	Murray	Roumani	Sherwin	Tim	Tom			

37181 DISCRETE MATHEMATICS
LEARNING PROGRESS CHECK 1

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INSTRUCTIONS. 40 minutes.
Upload **as a single PDF file** on Canvas/Assignments/LPC1 before 7:59pm Tuesday 1 March 2022.
Name your file as `LPC1-LastName-StudentID.pdf`. Show all relevant working and steps.
You may refer to your personal class notes.
Work on this on your own without discussing with anyone or using any paid homework websites.

1. (3 marks) Let p, q be statements. Decide whether or not each of the statements is a tautology. Justify your answer by either drawing a truth table, or otherwise.

   (a) $\neg(\neg p) \leftrightarrow p$

   (b) $\neg(p \vee q) \leftrightarrow \neg p \vee \neg q$

   (c) $p \vee \neg p \leftrightarrow q \wedge q$

   (d) $p \wedge (q \vee r) \leftrightarrow (p \wedge q) \vee r$

   (e) $p \vee (q \wedge r) \leftrightarrow (p \vee q) \wedge (p \vee r)$

   (f) $p \vee (p \wedge q) \leftrightarrow p$

2. (2 marks) Let the universe of discourse be all people. Let $L(x, y)$ mean "x loves y", and $C(x)$ mean "x lives in Campsie".

   Express the statement
   $$\forall x \exists y \, [C(x) \rightarrow (L(y, x) \wedge \neg C(y))]$$
   in *plain English*.

END OF LPC1

Date: Tuesday 1 March 2022.