

Name: \_\_\_\_\_

Entry number: \_\_\_\_\_

There are 3 questions for a total of 10 points.

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1. (a) (1 point) State true or false: The following compound proposition is a tautology.

$$((p \vee q) \wedge (\neg p \vee r)) \rightarrow \neg(\neg q \wedge \neg r)$$

(a) \_\_\_\_\_

- (b) (2 1/2 points) Give reason for your answer to part (a).

2. (3 points) Let  $C(p, q, r)$  denote a compound proposition involving simple propositions  $p, q,$  and  $r$ . Give a compound proposition  $C(p, q, r)$  the truth table of which matches the one given below. (*Note that there may be multiple correct answers for this question*)

<b>p</b>	<b>q</b>	<b>r</b>	<b>C(p, q, r)</b>
T	T	T	F
T	T	F	T
T	F	T	T
F	T	T	T
T	F	F	F
F	T	F	F
F	F	T	F
F	F	F	F

2. \_\_\_\_\_

3. (a) (1 point) State true or false: The following two compound propositions are logically equivalent:
- $(p \rightarrow q) \vee (r \rightarrow q)$
  - $(p \wedge r) \rightarrow q$

(a) \_\_\_\_\_

- (b) (2 1/2 points) Give reason for your answer to part (a).