

Study program: Computer Science, VGU
Algebra

Answer Key Sheet: Logic

1. (a) Yes
(b) No
(c) Yes
(d) Yes

2.

p	q	$\neg p$	$p \Rightarrow q$	$\neg p \wedge (p \rightarrow q)$
T	T	F	T	F
T	F	F	F	F
F	T	T	T	T
F	F	T	T	T

3.

4.

p	q	r	$p \Rightarrow q$	$q \Rightarrow r$	$(p \Rightarrow q) \wedge (q \Rightarrow r)$
T	T	T	T	T	T
T	T	F	T	F	F
T	F	T	F	T	F
T	F	F	F	T	F
F	T	T	T	T	T
F	T	F	T	F	F
F	F	T	T	T	T
F	F	F	T	T	T

5. (a) $\neg p \wedge q$
(b) $(p \wedge q) \wedge \neg r$

6.

A	B	C	D	$\neg A$	$\neg A \vee B$	$\neg C$	$\neg C \wedge D$	$(\neg A \vee B) \Rightarrow (\neg C \wedge D)$
T	T	T	T	F	T	F	F	F
T	T	T	F	F	T	F	F	F
T	T	F	T	F	T	T	T	T
T	T	F	F	F	T	T	F	F
T	F	T	T	F	F	F	F	T
T	F	T	F	F	F	F	F	T
T	F	F	T	F	F	T	T	T
T	F	F	F	F	F	T	F	T
F	T	T	T	T	T	F	F	F
F	T	T	F	T	T	F	F	F
F	T	F	T	T	T	T	T	T
F	T	F	F	T	T	T	F	F
F	F	T	T	T	T	F	F	F
F	F	T	F	T	T	F	F	F
F	F	F	T	T	T	T	T	T
F	F	F	F	T	T	T	F	F

7. Not valid.

8. Not valid

9. Valid

10. Valid

11.

12.

13. No

14. (a) Yes

(b) Yes

15.