
Exercises 1.1

1.

(d) Not a proposition. It would become a proposition if we made a substitution for x .

(i)

P	Q	R	$\sim Q$	$P \vee \sim Q$	$(P \vee \sim Q) \wedge R$
T	T	T	F	T	T
F	T	T	F	F	F
T	F	T	T	T	T
F	F	T	T	T	T
T	T	F	F	T	F
F	T	F	F	F	F
T	F	F	T	T	F
F	F	F	T	T	F

3. (a) false (b) true (c) true (d) true
 (e) false (f) false (g) false (h) false
 (i) true (j) true (k) false (l) false

8. (a) $(P \wedge Q) \vee (\sim P \wedge \sim Q)$ is neither.

P	Q	$\sim P$	$\sim Q$	$P \wedge Q$	$\sim P \wedge \sim Q$	$(P \wedge Q) \vee (\sim P \wedge \sim Q)$
T	T	F	F	T	F	T
F	T	T	F	F	F	F
T	F	F	T	F	F	F
F	F	T	T	F	T	T

10. (a) x is not a positive integer. (b) We won't win either the first or the second game.
 (c) $5 < 3$ (d) 641,371 is prime
 (e) Roses are not red or violets are not blue.
 (f) $x \geq y$ and $m^2 \geq 1$ (g) T is green and T is not yellow.
 (h) Sue will choose ice cream or she will not choose yogurt.