

# Øving 1

søndag 29. august 2021 08:12

1.1

14.

- (C) You miss the final exam and therefore you do not pass the course  
 (F) You have the flu and you miss the final exam or you don't miss the final exam and pass the course

16.

- (a)  $p \wedge \neg q$   
 (e)  $(p \wedge q) \rightarrow r$

1.3

12.

- (a)  $(\neg p \wedge (p \vee q)) \rightarrow q$

p	q	$\neg p$	$p \vee q$	$\neg p \wedge (p \vee q)$	$(\neg p \wedge (p \vee q)) \rightarrow q$
0	0	1	0	0	1
0	1	1	1	1	1
1	0	0	1	0	1
1	1	0	1	0	1

- (b)  $((p \rightarrow q) \wedge (q \rightarrow r)) \rightarrow (p \rightarrow r)$

p	q	r	$p \rightarrow q$	$q \rightarrow r$	$(p \rightarrow q) \wedge (q \rightarrow r)$	$(p \rightarrow r)$	$((p \rightarrow q) \wedge (q \rightarrow r)) \rightarrow (p \rightarrow r)$
0	0	0	1	1	1	1	1
0	0	1	1	1	1	1	1
0	1	1	1	1	1	1	1
0	1	0	1	0	0	1	1
1	0	0	0	1	0	0	1
1	1	0	1	0	0	0	1
1	0	1	0	1	0	1	1
1	1	1	1	1	1	1	1

- (c)  $(p \wedge (p \rightarrow q)) \rightarrow q$

p	q	$p \rightarrow q$	$p \wedge (p \rightarrow q)$	$(p \wedge (p \rightarrow q)) \rightarrow q$
0	0	1	0	1
0	1	1	0	1
1	0	0	0	1
1	1	1	1	1

- (d)  $((p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)) \rightarrow r$

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

p	q	r	$p \vee q$	$p \rightarrow r$	$q \rightarrow r$	$(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)$	$((p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)) \rightarrow r$
0	0	0	0	1	1	0	1
0	0	1	0	1	1	0	1
0	1	1	1	1	1	1	1
0	1	0	1	1	0	0	1
1	0	0	1	0	1	0	1
1	1	0	1	0	0	0	1
1	0	1	1	1	1	1	1
1	1	1	1	1	1	1	1

1.4

2.4

(d)  $\forall x (Q(x))$ ,  $Q(x) = x$  can solve ...

$\forall x \exists x (Q(x))$ ,  $y = \text{all people}$ ,  $x = \text{students}$

(e)  $\exists x (\neg R(x))$ ,  $R(x) = x$  want to be rich.

$\forall y \exists x (\neg P(x))$

1.5

1.2

(b)  $\exists x \exists y (\neg C(x,y))$

(c)  $\exists \text{Sanjay} \forall y \neq \text{Joseph} (C(\text{Sanjay}, y))$

3.0

(c)  $\neg (\forall x \exists y (P(x,y) \wedge \exists z (P(x,y,z)))) =$