MCS Assignment 2019-20 LaTeX template

abcd12

October 6, 2019

1 Discrete Mathematics and Linear Algebra

1.1

Inductive proof, so mostly text. Text is just written as normal, if you want to include maths notation in line you use the $ symbol we $n \geq 1$. If you use $$ it will go on a separate line.

$$2(\sqrt{n+1}-1) < 1 + \frac{1}{\sqrt{2}} + ... + \frac{1}{\sqrt{n}} < 2\sqrt{n}$$

1.2

You might want some Greek letters eg σ and Σ or maybe to square things $a^2 = b^2 + c^2$-

1.3

Some answer for q3

1.4

GRAPHS

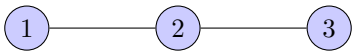


Figure 1: P_3

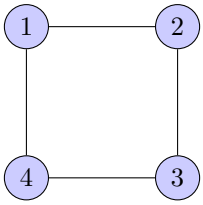


Figure 2: C_4

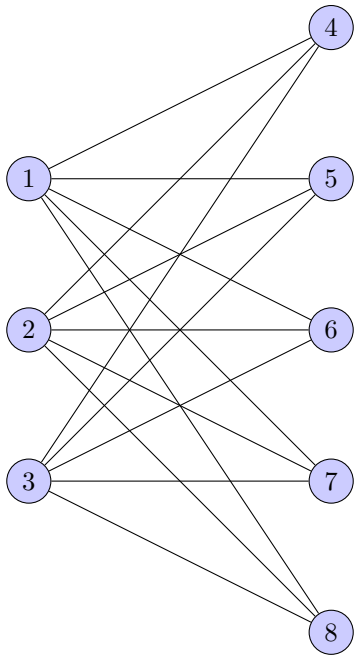


Figure 3: $K_{3,5}$

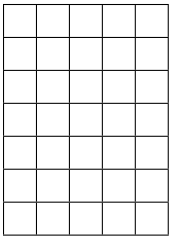
The graph in figure1 is P_3, i.e. a path on 3 nodes.
The graph in figure2 is C_4. i.e. a cycle on 4 nodes.
The graph in figure3 is $K_{3,5}$, i.e. the complete bipartite graph with sets of size 3 and 5.

2 Logic and Discrete Structures

2.1

$\varphi = ((a \wedge b) \implies c) \wedge (a \vee b)$

2.1.1



2.1.2

Since I've not used it yet: $\neg\varphi$

2.2

$\{\wedge, \oplus\}$ where $p \oplus q \equiv \neg(p \iff q)$

2.3

$p \vee (q \wedge r) \vdash p \vee q$

1.	$((P \to Q) \wedge (\neg R \to \neg Q))$	Supposition
2.	P	Supposition
3.	$((P \to Q) \wedge (\neg R \to \neg Q))$	1 Repeat
4.	$(P \to Q)$	3 Simplification
5.	Q	2, 4 Modus Ponens
6.	$(\neg R \to \neg Q)$	3 Simplification
7.	$\neg R$	Supposition
8.	$(\neg R \to \neg Q)$	6 Repeat
9.	$\neg Q$	7, 8 Modus Ponens
10.	Q	5 Repeat
11.	R	7–10 Reductio ad Absurdum
12.	$(P \to R)$	2-11 Conditionalization
13.	$(((P \to Q) \wedge (\neg R \to \neg Q)) \to (P \to R))$	1–12 Conditionalization

2.4

I guess you all need another subsection anyway, so lets learn how to cite[1]. If you want to cite a book or article, you need to find the BibTeX entry for it (just google the title and bibtex and you'll find it). But it in the bib.bib file, and then when you want to cite it just do backslash cite.

References

[1] A. Author. *The title of the work*. The name of the publisher, 3 edition, 1993.