

This assignment is due on Tuesday 19th March at the beginning of class. You may either handwrite this assignment or typeset it using \LaTeX ; either way please submit a .pdf file through UTORsubmit. Please also submit a hard copy in class.

1. Explain in plain English Fefferman's proof of the Fundamental Theorem of Algebra. Write in complete sentences and do not use any mathematical symbols.
2. Give a complete statement of Ramsey's theorem about edge colourings of finite graphs.
3. Prove that the Ramsey number $R(3, 3)$ is equal to 6.
4. Show that if the edges of the complete graph K_{10} are all coloured red or blue then there is either a red triangle or a blue K_4 .
5. Is it possible to colour each edge of K_9 red or blue in such a way that there is neither a red triangle nor a blue K_4 ?