Mathematical
Institute

Where does collaborating end and plagiarising begin?

Christopher Hollings

Mathematical Institute & The Queen's College
University of Oxford

Fridays@2, MT19, Week 3

Oxford
Mathematics

Why collaborate?

Collaboration is the natural state of mathematicians

For example:

- Early probability theory developed in the correspondence between Fermat and Pascal
- Much number theory at the hands of Hardy/Littlewood and Hardy/Ramanujan
- Abstract algebra through interactions between Emmy Noether and her students and colleagues
- Online via 'Polymath' https://polymathprojects.org/
- Umpteen seminars, conferences, workshops, etc., around the world

Exercise 1

Work in pairs: one member of the pair takes Problem A, the other Problem B. Sketch out a solution to your chosen problem, interacting with your partner if necessary.

Problem A:

Find an integer solution of the equation $x^3 + 6x - 20 = 0$ and prove that the equation has no other real solutions.

Problem B:

Let $x := \sqrt[3]{\sqrt{108} + 10} - \sqrt[3]{\sqrt{108} - 10}$. Prove that $x = 2$.

Now explain your solution to your partner; when you've finished, swap roles and repeat.

How did your collaboration work?

Are you sitting with a friend or a stranger?
How would your collaboration have differed?

How would your collaboration have differed if it had not been mediated by a tutor?

Effective collaboration

- Make sure you both understand the problem
- Establish common ground
- Be prepared to try out ideas — don't be afraid of being wrong!
- Be patient
- Listen!

[Extra points added with thanks to the participants in the session]

Exercise 2

Within your pairs, choose one of the problems from Exercise 1. Now working by yourself, write out a neat solution to the same problem as your partner (or to both!).

Now compare solutions with your partner.

Priority over continuity?

- Lagrange (1797):
  $f(x+h)-f(x)$ is small whenever h is small.

- Bolzano (1817):
  $f(x+\omega)-f(x)$ can be made smaller than any given quantity, if one makes ω as small as one ever wants to.

- Cauchy (1821):
  an infinitely small increase of the variable always produces an infinitely small increase of the function itself.

What is plagiarism?

Plagiarism

Oxford English Dictionary:
The action or practice of taking someone else's work, idea, etc., and passing it off as one's own; literary theft.

University definition:
Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Plagiarism may be intentional or reckless, or unintentional. Under the regulations for examinations, intentional or reckless plagiarism is a disciplinary offence.

https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism?wssl=1

Tips on avoiding plagiarism

- Collaborate on the solution of problems, but then write them up separately
- If you don't know how to do a problem, try to take hints from your friends, rather than whole methods
- Try to write up problems using words to link formulae — you're more likely to use your own phrasing (and make life easier for your tutor)
- Take care over self-plagiarism — don't just copy from work that has already been assessed elsewhere
- When making notes from (electronic) sources, paraphrase, do not copy and paste (you'll assimilate the material better as well)
- Keep track of where your information comes from, and when writing extended essays and dissertations, give references
- If unsure about the origins of an idea, or how to cite it, give a reference to where you learned about it yourself (especially if you're just giving a quick overview of a topic)

[Extra points added with thanks to the participants in the session]

Questions? Comments? Concerns?