

Being a Professional Mathematician

Mathematics: a static body of knowledge? – worksheet

Exercise	Tutor's comments
<p>1) Do you regard mathematics as an essentially static, already worked out, body of knowledge or as a developing subject in which new discoveries are being made?</p> <p>Has your view changed during your degree studies?</p>	
<p>2) Identify mathematical topics from your degree which were developed to their present level:</p> <ul style="list-style-type: none">• Before 1600• In the seventeenth century• In the eighteenth century• In the nineteenth century• In the first half of the twentieth century• In the second half of the twentieth century• In the 21st century <p>Can you identify mathematical ideas you have come across during your studies that were not known ten years ago?</p> <p>If not, is this because there are no mathematicians working today or because it takes time for new ideas to reach the university curriculum?</p>	<p>Possible answers (not necessarily definitive, or even right! Most of these are ongoing)</p> <p>Before 1600: Euclidean geometry C17: logarithms, calculus C18: Euler's work C19: analysis, electrodynamics Early C20: relativity, classical number theory, probability and statistics. Even Galois theory! Late C20: group theory, combinatorics, operational research, statistics, numerical mathematics, cryptography (RSA), Black-Scholes C21: ??</p>
<p>3) Where are mathematicians creating new mathematics?</p> <p>Of the mathematicians interviewed in the case studies at www.BeingAMathematician.org which ones say they are creating new mathematics?</p> <p>Do you think the others, who are generally being paid to solve problems that no-one has solved before, are not creating new mathematics, then what are they doing?</p> <p>How do mathematicians disseminate their work? (Many of the interviews talk about this.)</p> <p>Why does it take new ideas so long to reach the University curriculum?</p>	<p>In academia? In industry? In the financial sector? Sitting at computers? At blackboards?</p> <p>Stallard and Porter (the academics) are explicit that they are creating new mathematics. Dyson's account of doing mathematics is worth discussion. Most of the others don't say it explicitly but they discuss disseminating their work, which implies new ideas! Danny Brown, as a teacher, might not be thought to be creating new mathematics, though he may be making new mathematicians.</p>

Find recent news stories about mathematics. How do they present the mathematics? Do the reporters get it right?

Would a non-mathematician appreciate, from their school education, from news coverage, or from other sources, that mathematics is a living subject in which new discoveries are being made?

Why do we not often read about new mathematical ideas in the newspapers? (Mason Porter talks about this in the interview at www.BeingAMathematician.org, at 8:39).

How is mathematics presented at the annual British Science Festival ([//www.britishecienceassociation.org/web/britisheciencefestival/](http://www.britishecienceassociation.org/web/britisheciencefestival/))?

Why do you think there are relatively few presentations about new discoveries in pure mathematics at this Festival?

It is very hard to convey pure mathematical ideas to the lay public in a short talk in the Festival format. The organisers would be delighted if more such maths were presented in an accessible way!

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