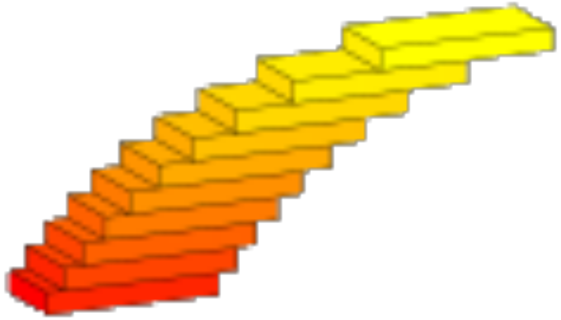
EAMS - 2018

Improving the quality of questions in online assessment for mathematics.



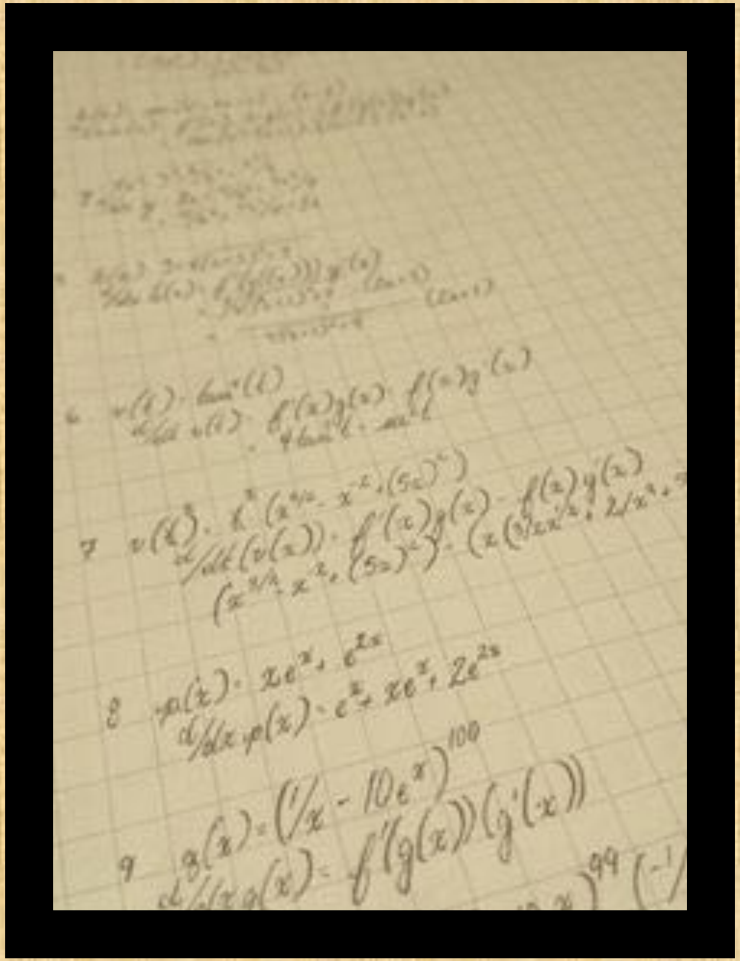
Dr. Konstantina Zerva

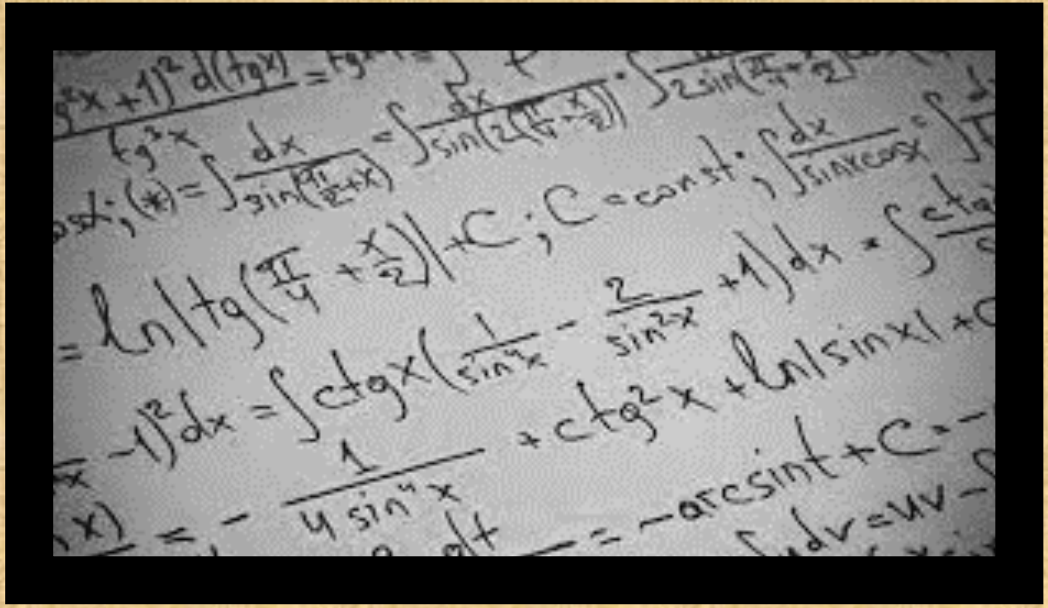
School of Mathematics

University of Edinburgh

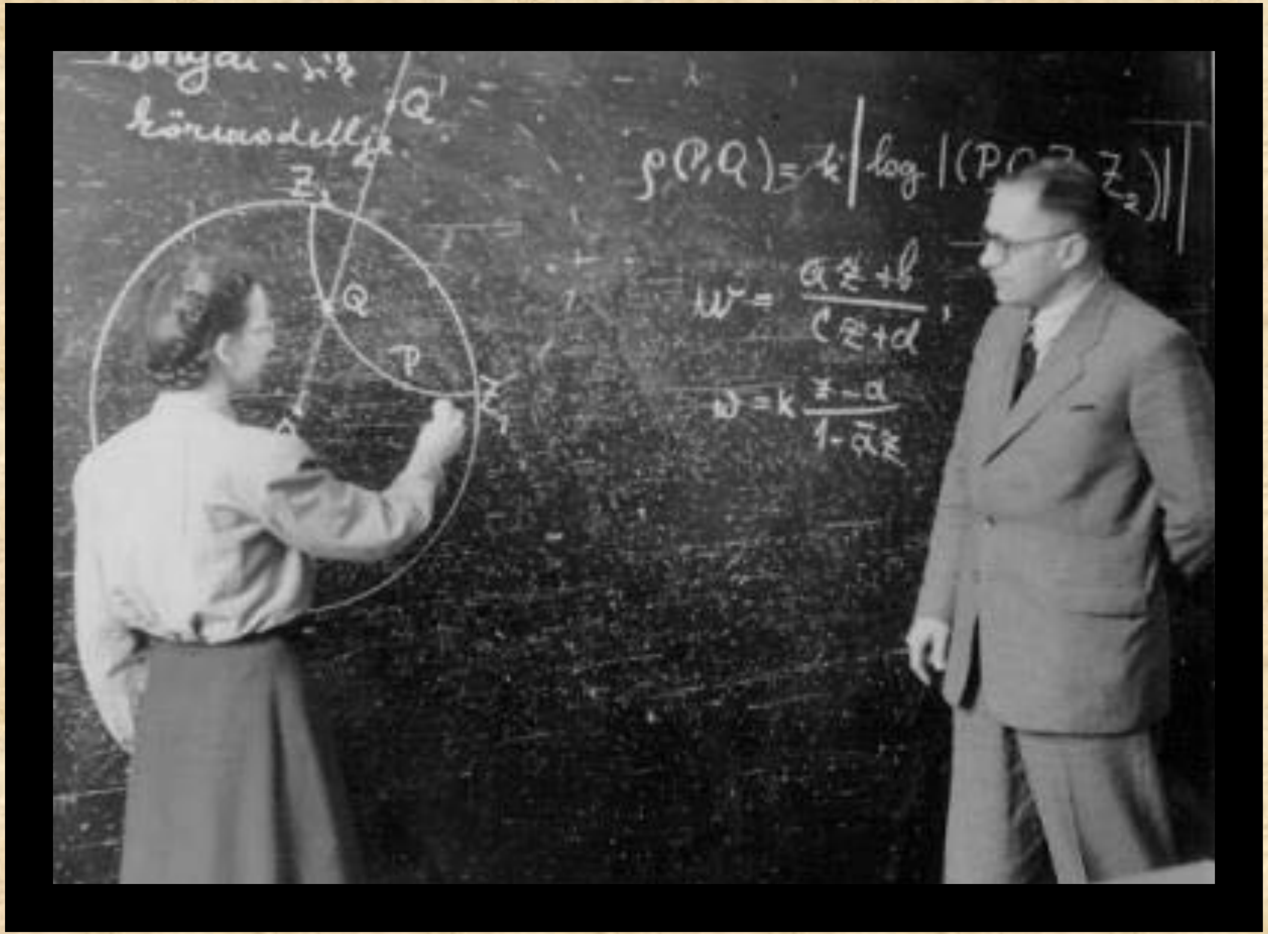
Assessment

Traditional Assessment methods

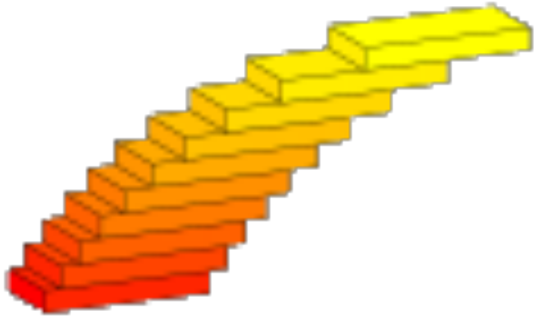




Traditional Assessment methods



E – Assessment at the School of Mathematics



System for
Teaching and
Assessment using a
Computer algebra
Kernel

STACK Assessments in 1st Year Courses

Semester 1:

- Introduction to Linear Algebra (ILA) ~ 600 students
- Mathematics for Natural Sciences 1a (MNS) ~ 150 students

Semester 2:

- Calculus and its applications (CAP) ~ 500 students
- Engineering Mathematics 1b (EM) ~ 300 students
- Mathematics for Natural Sciences 1b (MNS) ~ 150 students

STACK Assessments in 1st Year Courses

Introduction to Linear Algebra

- 2 Reading Quizzes: 2 – 3 questions
- 1 Skill Quiz: 4 – 7 questions
- Around 110 questions

MNS 1b – EM 1b

- 3 Reading Quizzes: 3 – 5 questions
- 1 Assessed Quiz: 7 – 10 questions
- Around 200 questions

MNS 1a

- 3 Reading Quizzes: 5 questions
- 1 Assessed Quiz: 7 – 10 questions
- Around 240 questions

Calculus & Applications

- 1 Reading Quiz: 4 questions
- 1 Skill Quiz: 10 questions
- Around 150 questions

STACK Assessments in 1st Year Courses

700 used questions

+

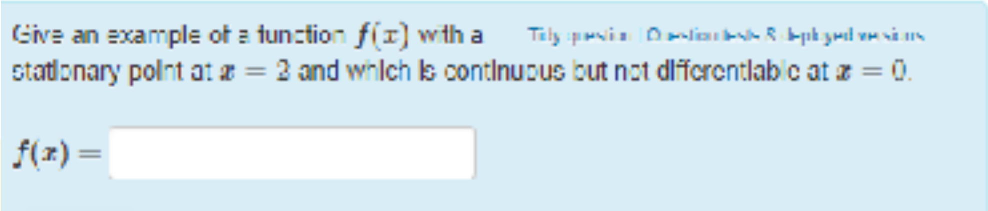
300 unused questions

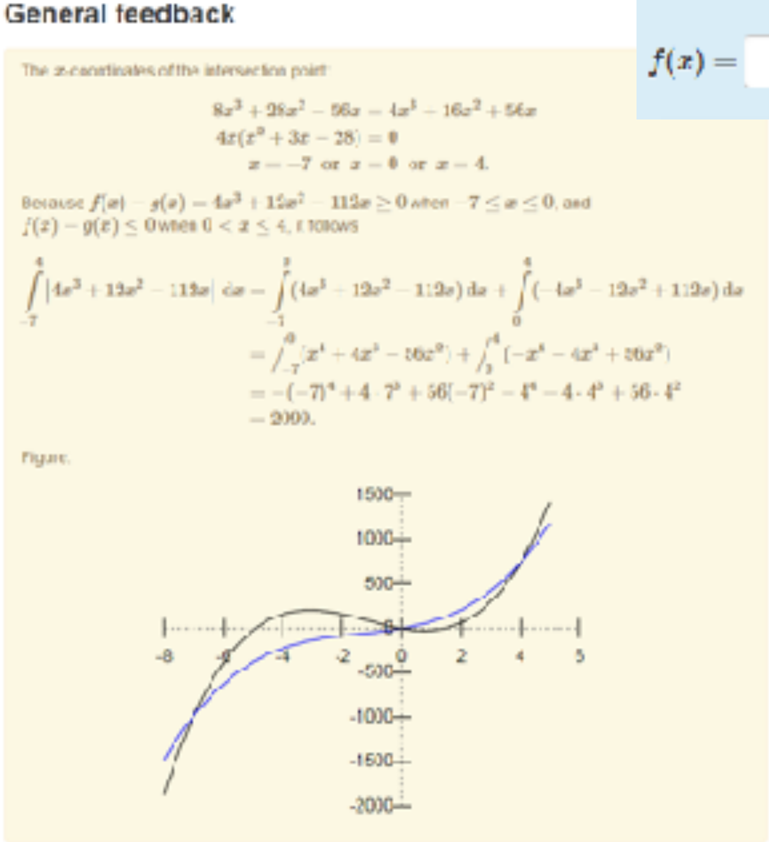
=

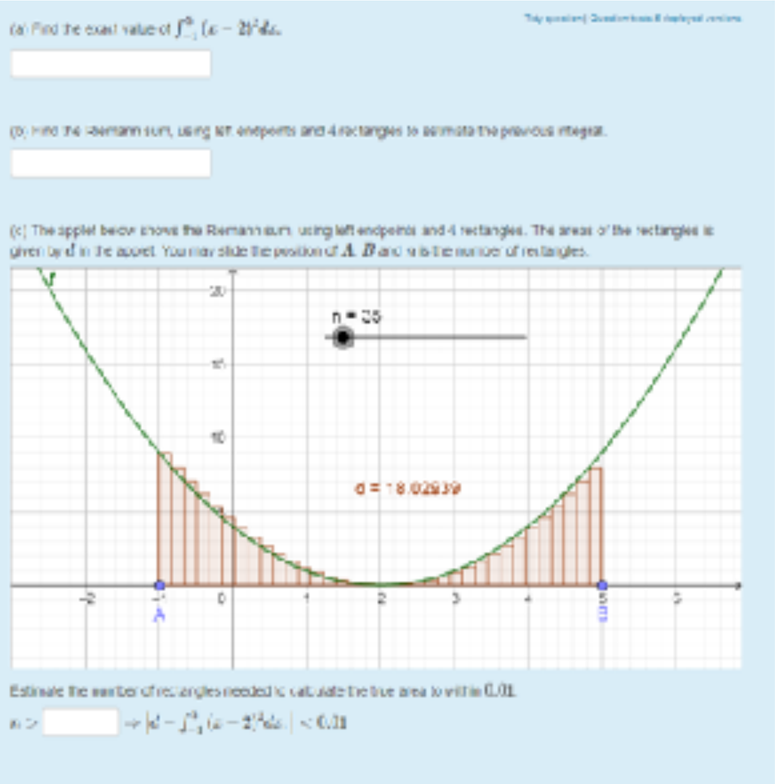
1000 questions

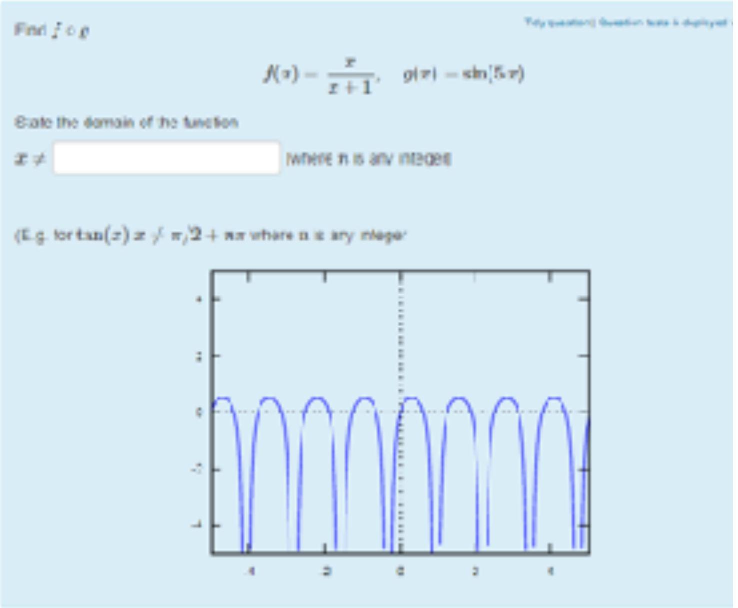
What is a good quality CAA?

Use all the tools we have…









Review our Assessments

- Quiz level review
- Question level review

Advantage of e-Assessment: we have all the data stored.

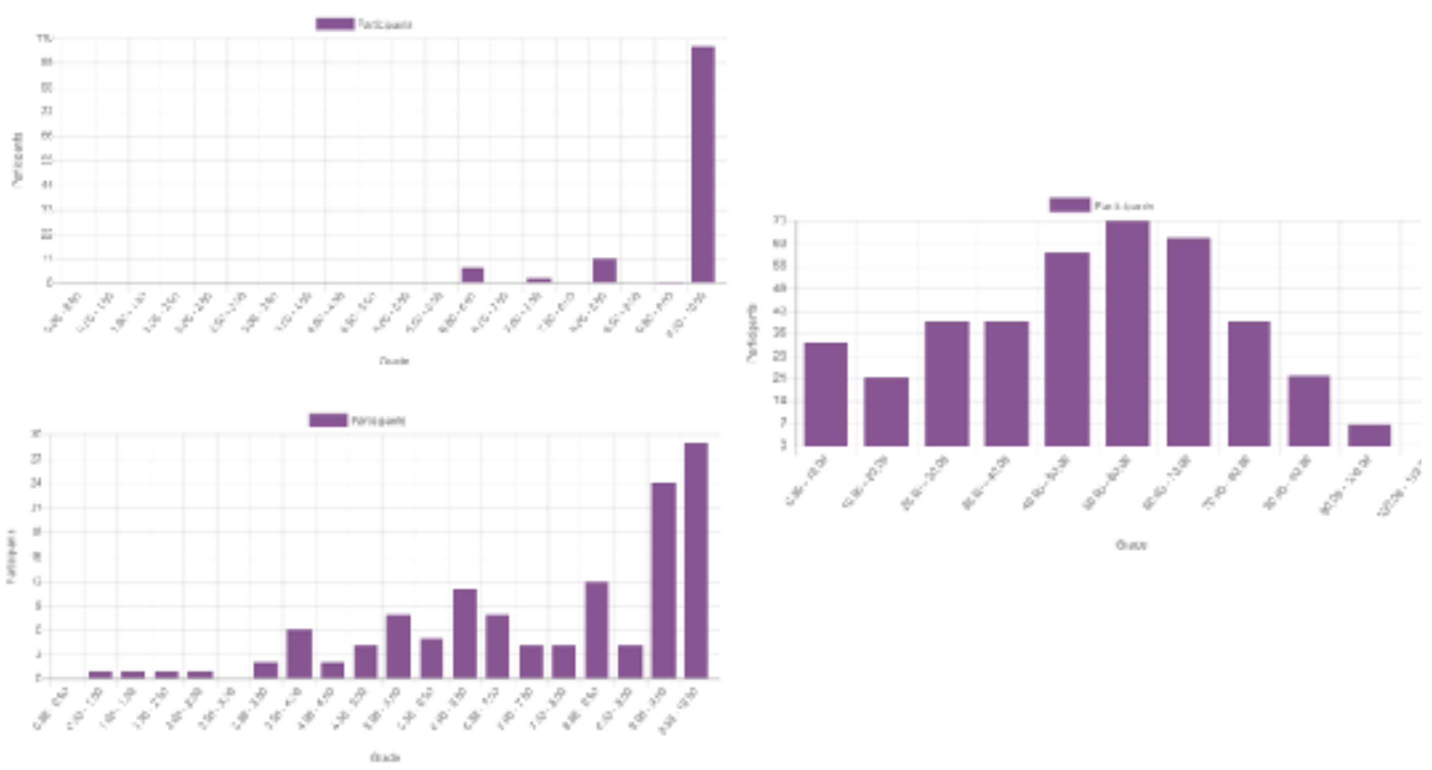
✓ Marks

✓ Time

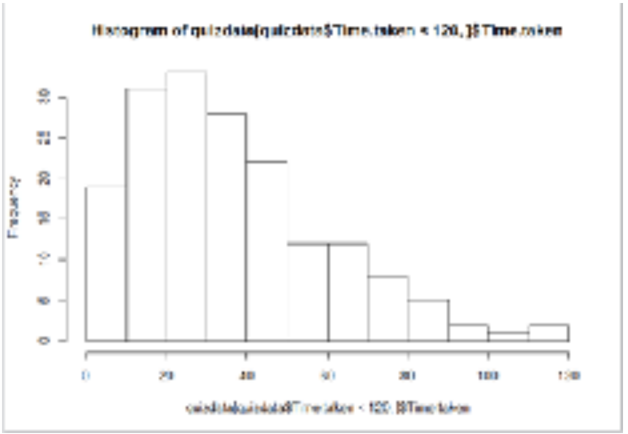
✓ Attempts

Review our Assessments – Quiz level

Marks Distribution



Time Distribution



Review our Assessments – Question level

Are all random versions equal?

	Q#	Question name	Attempts	Facility index	Standard deviation	Random guess score	Intended weight	Effective weight	Discrimination index	Discriminative efficiency
	1	L1.1 Q3c Fractional powers	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	1.1	Variant 1 of L1.1 Q3c Fractional powers	18	75.02%	43.86%	0.00%	10.00%		63.36%	81.27%
	1.2	Variant 2 of L1.1 Q3c Fractional powers	10	75.00%	45.80%	0.00%	10.00%		0.99%	1.23%
	1.3	Variant 3 of L1.1 Q3c Fractional powers	[illegible]	[illegible]	40.66%	0.00%	10.00%		18.50%	25.48%
	1.4	Variant 4 of L1.1 Q3c Fractional powers	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
	1.5	Variant 5 of L1.1 Q3c Fractional powers	13	84.62%	37.55%	0.00%	10.00%		51.38%	66.56%
	1.6	Variant 6 of L1.1 Q3c Fractional powers	12	91.67%	28.87%	0.00%	10.00%		-12.29%	-22.47%
	1.7	Variant 7 of L1.1 Q3c Fractional powers	[illegible]	[illegible]	[illegible]	0.00%	10.00%		[illegible]	[illegible]
	1.8	Variant 8 of L1.1 Q3c Fractional powers	17	94.12%	24.25%	0.00%	10.00%		59.14%	87.22%
	1.9	Variant 9 of L1.1 Q3c Fractional powers	[illegible]	[illegible]	[illegible]	0.00%	10.00%		19.22%	[illegible]

4	L1.1 Q3b Fraction simplification	142	100.00%	0.00%	0.00%	20.00%	0.00%
4.1	Variant 1 of L1.1 Q3b Fraction simplification	21	100.00%	0.00%	0.00%	20.00%	
4.2	Variant 2 of L1.1 Q3b Fraction simplification	17	100.00%	0.00%	0.00%	20.00%	
4.3	Variant 3 of L1.1 Q3b Fraction simplification	13	100.00%	0.00%	0.00%	20.00%	
4.4	Variant 4 of L1.1 Q3b Fraction simplification	15	100.00%	0.00%	0.00%	20.00%	
4.5	Variant 5 of L1.1 Q3b Fraction simplification	6	100.00%	0.00%	0.00%	20.00%	
4.6	Variant 6 of L1.1 Q3b Fraction simplification	15	100.00%	0.00%	0.00%	20.00%	
4.7	Variant 7 of L1.1 Q3b Fraction simplification	10	100.00%	0.00%	0.00%	20.00%	
4.8	Variant 8 of L1.1 Q3b Fraction simplification	19	100.00%	0.00%	0.00%	20.00%	
4.9	Variant 9 of L1.1 Q3b Fraction simplification	20	100.00%	0.00%	0.00%	20.00%	

Simplify the algebraic expression: $z^{3} \times z^{-9}$.

Simplify the algebraic expression: $z^{17} \times z^{-10}$.

Thank you for attending!

You may want to prove that:

$$\sqrt[3]{\sqrt{108}+10}-\sqrt[3]{\sqrt{108}-10}=2$$