

Comparison of Scaled Marks

2019 HSC Mathematics Subjects

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Some students express a preference for Standard Mathematics instead of Mathematics with the belief that the former will result in a higher ATAR. This note highlights some aspects of the scaling adopted for the 2019 HSC. The data are obtained from 'ATAR 2019. Preliminary report on the Scaling of the 2019 NSW Higher School Certificate'

<https://www.uac.edu.au/assets/documents/atar/preliminary-scaling-report.pdf>

(1) Distribution of HSC marks.

Table A4 of the above document shows the percentage of students below a given number of marks out of 50. The relevant extract is:

Course	Year	Number	Percentage of students with HSC mark less than:				
			45	40	35	30	25
Mathematics Standard 2	2019	29,656	94.8	75.7	43.3	16.4	2.9
Mathematics General	2018	30,824	93.4	73.1	46.9	20.1	5.4
Mathematics	2019	17,311	76.4	50.7	21.5	7.6	2.6
	2018	17,825	77.5	48.1	22.1	7.4	2.0
Mathematics Extension 1	2019	8,830	60.9	36.6	19.7	9.6	4.4
	2018	9,021	67.1	40.4	20.1	9.5	3.6
Mathematics Extension 2	2019	3,134	64.2	32.5	14.1	7.0	3.0
	2018	3,164	66.8	34.3	14.4	5.9	2.1

Extract form Table A4: Distribution of HSC marks

First note that around 30000 students sit the Standard 2 exam while around 17500 sit the Mathematics exam.

Now focus on the percentage of students with HSC mark less than 25 out of 50. These percentages are very similar for Standard 2 and Mathematics ((2.9% and 2.6% respectively).

At the other end of the scale, 94.8% of Standard 2 students achieve less than 45 out of 50 while 76.4% of Mathematics students do so.

(2) Distribution of Scaled marks

Table A5 provides the same information for the scaled marks (see Table extract on p2).

If we look at the comparable percentages we see a vast difference between Standard 2 and Mathematics.

Approximately 61% of Standard 2 students received a scaled mark less than 25 out of 50 while only 24.3% of Mathematics students did so.

Further, no Standard 2 student received a scaled mark greater than 45 out of 50 while 4.1% of Mathematics students achieved this.

Course	Year	Number	Percentage of students with scaled mark less than:						
			45	40	35	30	25	20	15
Mathematics Standard 2	2019	29,656	100.0	97.2	88.1	75.4	60.8	45.1	29.1
Mathematics General	2018	30,824	99.8	95.5	86.6	75.0	61.8	47.2	31.8
Mathematics	2019	17,311	95.9	81.3	61.3	40.7	24.3	13.5	7.2
	2018	17,825	96.4	81.5	60.5	40.5	24.0	13.2	6.8
Mathematics Extension 1	2019	8,830	82.0	45.5	21.7	10.2	4.8	1.9	1.0
	2018	9,021	78.8	45.6	21.4	9.9	3.9	1.5	0.6
Mathematics Extension 2	2019	3,134	64.5	18.6	6.3	2.4	0.8	0.1	0.0
	2018	3,164	52.5	13.7	4.6	1.5	0.7	0.3	0.1

Extract from Table A5: Distribution of Scaled marks

Figure 1 shows the cumulative percentage of the HSC and Scaled marks for Standard 2. The horizontal distance between the two curves is the reduction in mark from HSC to Scaled for the relevant cumulative percent. The reduction decreases as the mark increases.

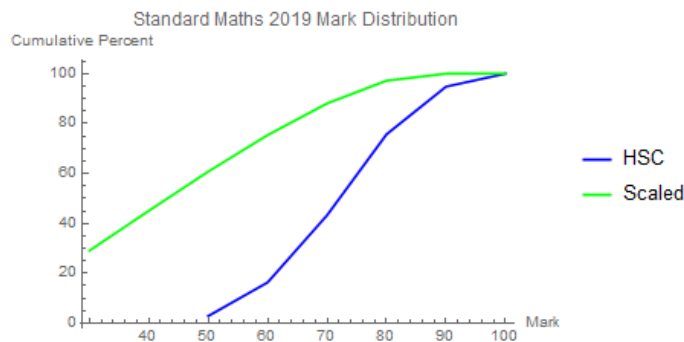


Figure 1

Figure 2 shows the same information as Figure 1 with the additional information that 75% of Standard 2 students achieved an HSC mark less than 80 and a Scaled mark less than 60

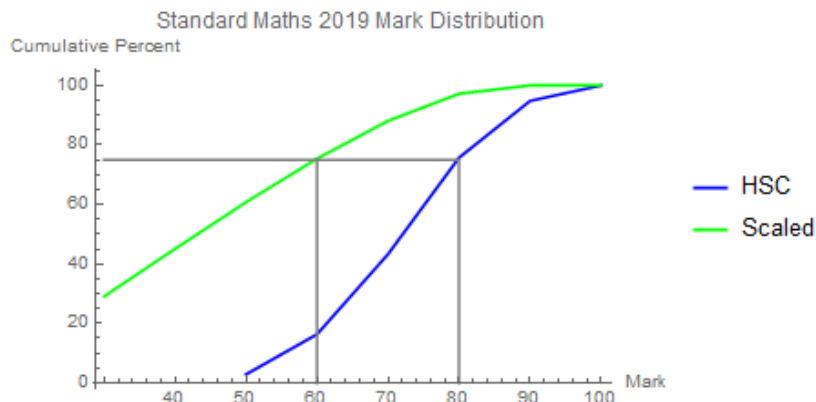


Figure 2

Figure 3 shows the corresponding information for Mathematics. The reduction from HSC to Scaled is less than that for Standard 2.

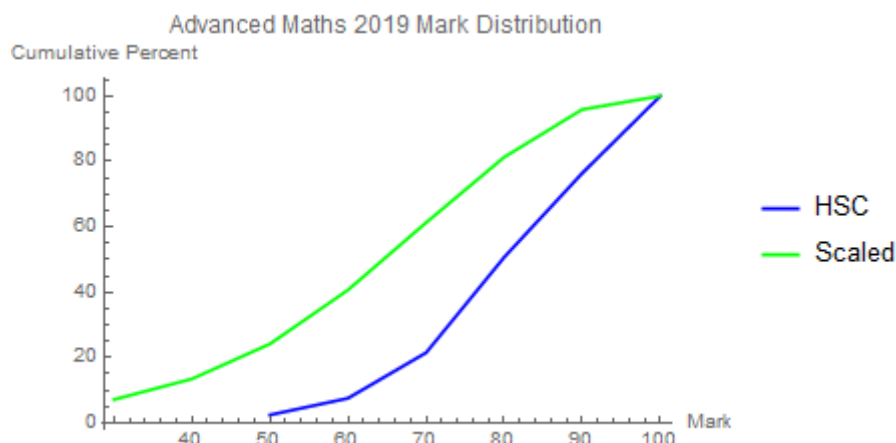


Figure 3

(3) Selected cumulative percentages for both HSC and Scaled marks

Course	Number	Type of mark	Mean	SD	Max. mark	P ₉₉	P ₉₀	P ₇₅	P ₅₀	P ₂₅
Mathematics Standard 2	29,656	HSC	35.5	5.9	50.0	47.0	43.0	39.5	36.0	31.5
		scaled	21.8	10.1	45.8	41.7	35.8	29.9	21.5	13.7
Mathematics	17,311	HSC	39.2	6.7	50.0	49.0	47.0	44.5	39.5	35.5
		scaled	31.1	9.6	50.0	47.2	42.6	38.3	32.3	25.2
Mathematics Extension 1	8,830	HSC	40.3	7.9	50.0	49.5	48.0	46.0	43.0	36.0
		scaled	39.1	7.0	50.0	48.6	46.2	44.1	40.7	35.9
Mathematics Extension 2	3,134	HSC	41.0	6.7	50.0	49.0	47.5	46.0	42.5	38.0
		scaled	42.9	4.5	50.0	49.0	47.3	45.9	43.7	41.1

Extract from Table A3: Cumulative percentages

The P90 column shows the 90th percentile ie 90% of the marks lie below this value. The reduction from HSC to Scaled mark was from 43.0 to 35.8 for Standard 2 and from 47.0 to 42.6 for Mathematics (highlighted). Therefore a larger reduction from HSC to Scaled marks occurs for Standard 2 and this reduction is more extreme for lower percentiles.

(4) Performance Band distributions

The last item of interest is the distribution of Performance Bands. Table A2 provides the percentages of students in Performance Bands 2 – 6 with 6 being the highest. Figure 4 shows this information as a paired bar graph. The distribution is approximately symmetrical for Standard 2 but skewed toward the higher Bands for Mathematics.

A Band 6 result was achieved by 24% of Mathematics students but by only 5% of Standard 2 students.

A result of Band 5 or 6 was achieved by half of the Mathematics students and just under one - quarter of the Standard 2 students.

Universities sometimes require Band 4 or higher in Mathematics and this was achieved by 79% of students.

Course	Number	Median HSC mark	Median Band	Percentage students in Performance Band				
				6	5	4	3	2
Mathematics Standard 2	29,656	72	4	5	19	32	27	13
Mathematics	17,311	79	4	24	26	29	14	5
Mathematics Extension 1	8,830	43	E3			39	41	15
Mathematics Extension 2	3,134	85	E3			36	50	11

Extract from Table A2: Performance Band distribution

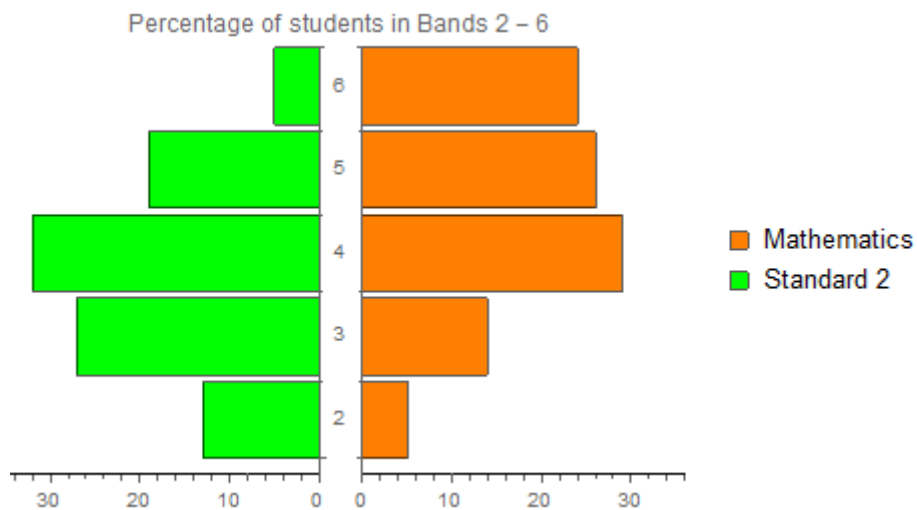


Figure 4: Distribution of Bands

