

# Students Value Advanced Mathematics Scale

The Students Value Advanced Mathematics (SVM) scale was created based on students' degree of agreement with the nine statements described below.

## Items in the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale

		How much do you agree with these statements about the mathematics you are studying?			
		Agree a lot	Agree a little	Disagree a little	Disagree a lot
MSBM21A	1) Learning mathematics will help me get ahead in the world-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21B	2) It is important to do well in my mathematics class -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21C*	3) The mathematics I am studying is not useful for my future* -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21D	4) My parents are pleased that I am taking advanced mathematics -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21E	5) Doing well in mathematics will help me get into the university of my choice -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21F*	6) Learning advanced mathematics does not seem to be a worthwhile exercise* -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21G	7) My parents think that it is important that I do well in my mathematics class-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21H	8) I like telling people I am studying advanced mathematics -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MSBM21 I	9) Learning advanced mathematics will give me more job opportunities -----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*Reverse coded					

**Item Parameters for the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale**

Item	delta	tau_1	tau_2	tau_3	Infit
MSBM21A	0.07051	-1.13081	-0.21324	1.34405	0.94
MSBM21B	-0.33686	-1.13710	-0.21075	1.34785	0.84
MSBM21C*	0.58705	-1.02374	-0.04630	1.07004	1.35
MSBM21D	-0.34160	-0.88413	-0.47165	1.35578	0.93
MSBM21E	-0.16646	-0.40870	-0.14215	0.55085	0.90
MSBM21F*	0.03347	-0.91420	-0.19645	1.11065	1.57
MSBM21G	-0.65475	-0.83420	-0.49183	1.32603	0.93
MSBM21H	0.90365	-1.13939	0.07749	1.06190	1.25
MSBM21I	-0.09501	-0.78067	-0.26783	1.04850	0.81

\*Reverse coded

**Scale Transformation Constants for the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale**

Scale Transformation Constants

A = 8.202488

B = 1.658016

Transformed Scale Score = 8.202488 + 1.658016 • Logit Scale Score

**Equivalence Table of the Raw Score and the Transformed Scale Score for the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale**

Raw Score	Transformed Scale Score	Cutpoint
0	1.74486	
1	3.54182	
2	4.39260	
3	4.97121	
4	5.42447	
5	5.80430	
6	6.13612	
7	6.44041	
8	6.72231	
9	6.98816	
10	7.24296	
11	7.49073	
12	7.73488	
13	7.97837	8.0
14	8.22472	
15	8.47440	
16	8.73231	
17	9.00052	
18	9.28212	
19	9.57930	
20	9.89879	
21	10.24631	
22	10.63156	
23	11.07036	11.0
24	11.58834	
25	12.24488	
26	13.18781	
27	15.09728	

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015

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**Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale, Advanced Mathematics**

Country	Cronbach's Alpha Reliability Coefficient	Percent of Variance Explained	Component Loadings for Each Item									
			MSBM21A	MSBM21B	MSBM21C*	MSBM21D	MSBM21E	MSBM21F*	MSBM21G	MSBM21H	MSBM21I	
France	0.81	41	0.65	0.62	0.63	0.59	0.68	0.65	0.58	0.58	0.75	
Italy	0.85	46	0.79	0.74	0.63	0.61	0.69	0.69	0.53	0.58	0.79	
Lebanon	0.67	32	0.41	0.71	0.42	0.67	0.64	0.31	0.63	0.45	0.65	
Norway	0.73	35	0.69	0.68	0.39	0.63	0.67	0.65	0.52	0.35	0.62	
Portugal	0.83	44	0.76	0.68	0.64	0.64	0.67	0.70	0.55	0.50	0.76	
Russian Federation	0.83	45	0.72	0.76	0.36	0.75	0.75	0.51	0.73	0.58	0.78	
Russian Federation 6hr+	0.82	45	0.74	0.77	0.30	0.75	0.76	0.50	0.72	0.52	0.80	
Slovenia	0.73	34	0.72	0.44	0.46	0.70	0.57	0.08	0.63	0.60	0.77	
Sweden	0.76	36	0.73	0.54	0.64	0.60	0.61	0.68	0.44	0.39	0.67	
United States	0.81	42	0.74	0.73	0.60	0.63	0.66	0.62	0.58	0.48	0.76	
International Avg.	0.78	39	0.69	0.66	0.53	0.65	0.66	0.54	0.58	0.50	0.73	

\*Reverse coded

**Relationship Between the TIMSS Advanced 2015 Students Value Advanced Mathematics Scale, and TIMSS Advanced 2015 Advanced Mathematics Achievement**

Country	Pearson's Correlation with Advanced Mathematics Achievement		Variance in Advanced Mathematics Achievement Accounted for by Difference Between Regions of the Scale ( $\eta^2$ )
	(r)	(r <sup>2</sup> )	
France	0.36	0.13	0.11
Italy	0.24	0.06	0.05
Lebanon	0.25	0.06	0.04
Norway	0.23	0.05	0.04
Portugal	0.36	0.13	0.11
Russian Federation	0.29	0.08	0.07
Russian Federation 6hr+	0.28	0.08	0.08
Slovenia	0.40	0.16	0.14
Sweden	0.24	0.06	0.04
United States	0.24	0.06	0.05
International Median	0.25	0.06	0.05

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS 2015