

TRENDS IN INTERNATIONAL MATHEMATICS AND SCIENCE STUDY

TIMSS



TIMSS 2007 User Guide for the International Database

Released Items

Mathematics – Eighth Grade



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International Study Center
Lynch School of Education, Boston College

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TIMSS 2007 User Guide for the International Database

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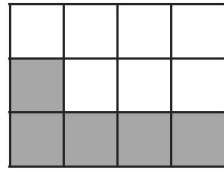
Item ID	Subject	Grade	Block	Block Seq	Content Domain	Cognitive Domain	Maximum Points	Key
M022043	M	8	M01	01	Number	Knowing	1	D
M022046	M	8	M01	02	Number	Applying	1	See scoring guide
M022049	M	8	M01	03	Geometry	Reasoning	1	D
M022050	M	8	M01	04	Algebra	Knowing	1	E
M022055	M	8	M01	05	Geometry	Applying	1	See scoring guide
M022057	M	8	M01	06	Number	Applying	1	C
M022257	M	8	M01	07	Data and Chance	Applying	1	C
M022062	M	8	M01	08	Geometry	Applying	1	B
M022066	M	8	M01	09	Number	Knowing	1	D
M022232	M	8	M01	10	Number	Applying	2	See scoring guide
M022234A	M	8	M01	11	Geometry	Applying	2	See scoring guide
M022234B	M	8	M01	11	Number	Applying	2	See scoring guide
M022243	M	8	M01	12	Geometry	Applying	1	See scoring guide
M042003	M	8	M02	01	Number	Knowing	1	D
M042079	M	8	M02	02	Number	Knowing	1	C
M042018	M	8	M02	03	Number	Applying	1	See scoring guide
M042055	M	8	M02	04	Number	Applying	1	B
M042039	M	8	M02	05	Number	Applying	1	A
M042199	M	8	M02	06	Algebra	Knowing	1	D
M042301A	M	8	M02	07	Algebra	Knowing	1	See scoring guide
M042301B	M	8	M02	07	Algebra	Reasoning	1	See scoring guide
M042301C	M	8	M02	07	Algebra	Reasoning	1	See scoring guide
M042263	M	8	M02	08	Algebra	Reasoning	1	See scoring guide
M042265	M	8	M02	09	Geometry	Reasoning	1	C
M042137	M	8	M02	10	Geometry	Applying	1	C
M042148	M	8	M02	11	Geometry	Knowing	1	B
M042254	M	8	M02	12	Data and Chance	Applying	1	A
M042250	M	8	M02	13	Data and Chance	Knowing	1	See scoring guide
M042220	M	8	M02	14	Data and Chance	Applying	2	See scoring guide
M042273	M	8	M02	15	Data and Chance	Reasoning	1	D
M022097	M	8	M03	01	Number	Knowing	1	C
M022101	M	8	M03	02	Data and Chance	Knowing	1	A
M022104	M	8	M03	03	Number	Knowing	1	D
M022105	M	8	M03	04	Geometry	Knowing	1	D
M022106	M	8	M03	05	Number	Applying	1	See scoring guide
M022108	M	8	M03	06	Geometry	Applying	1	C
M022110	M	8	M03	07	Number	Knowing	1	See scoring guide
M022181	M	8	M03	08	Data and Chance	Applying	1	B
M032307	M	8	M03	09	Number	Applying	1	See scoring guide
M032523	M	8	M03	10	Number	Applying	1	B
M032701	M	8	M03	11	Number	Applying	1	C
M032704	M	8	M03	12	Number	Applying	1	B
M032525	M	8	M03	13	Number	Knowing	1	A
M032579	M	8	M03	14	Geometry	Applying	1	B
M032691	M	8	M03	15	Geometry	Applying	1	See scoring guide
M042001	M	8	M04	01	Number	Knowing	1	B
M042022	M	8	M04	02	Number	Knowing	1	C
M042082	M	8	M04	03	Algebra	Knowing	1	A

Item ID	Subject	Grade	Block	Block Seq	Content Domain	Cognitive Domain	Maximum Points	Key
M042088	M	8	M04	04	Algebra	Knowing	1	A
M042304A	M	8	M04	05	Number	Applying	1	See scoring guide
M042304B	M	8	M04	05	Number	Applying	2	See scoring guide
M042304C	M	8	M04	05	Number	Applying	1	See scoring guide
M042304D	M	8	M04	05	Number	Reasoning	2	See scoring guide
M042267	M	8	M04	06	Algebra	Applying	1	D
M042239	M	8	M04	07	Algebra	Knowing	1	A
M042238	M	8	M04	08	Algebra	Applying	1	C
M042279	M	8	M04	09	Geometry	Reasoning	1	B
M042036	M	8	M04	10	Geometry	Reasoning	1	D
M042130	M	8	M04	11	Geometry	Applying	1	See scoring guide
M042303A	M	8	M04	12	Data and Chance	Knowing	1	See scoring guide
M042303B	M	8	M04	12	Data and Chance	Reasoning	2	See scoring guide
M042222	M	8	M04	13	Data and Chance	Knowing	1	A
M032142	M	8	M05	01	Number	Applying	1	B
M032198	M	8	M05	02	Algebra	Knowing	1	D
M032640	M	8	M05	03	Algebra	Reasoning	2	See scoring guide
M032344	M	8	M05	04	Geometry	Applying	1	See scoring guide
MP32754	M	8	M05	05				
M032754	M	8	M05	05	Geometry	Applying	1	See scoring guide
M032755	M	8	M05	06	Number	Reasoning	2	See scoring guide
M032753A	M	8	M05	07	Data and Chance	Reasoning	2	See scoring guide
M032753B	M	8	M05	07	Data and Chance	Reasoning	2	See scoring guide
MP32753	M	8	M05	07				
M032753C	M	8	M05	07	Data and Chance	Knowing	1	See scoring guide
M032756	M	8	M05	08	Data and Chance	Reasoning	1	See scoring guide
M032205	M	8	M05	09	Geometry	Applying	1	B
M032163	M	8	M05	10	Algebra	Applying	1	C
M032381	M	8	M07	01	Number	Reasoning	1	See scoring guide
M032416	M	8	M07	02	Number	Knowing	1	D
M032160	M	8	M07	03	Number	Applying	1	D
M032273	M	8	M07	04	Algebra	Applying	1	B
M032540	M	8	M07	05	Algebra	Knowing	1	D
M032698	M	8	M07	06	Algebra	Knowing	1	A
M032097	M	8	M07	07	Geometry	Applying	1	C
M032575	M	8	M07	08	Geometry	Applying	1	B
M032414	M	8	M07	09	Geometry	Applying	1	See scoring guide
M032294	M	8	M07	10	Geometry	Applying	1	A
M032688	M	8	M07	11	Data and Chance	Applying	1	See scoring guide
M032529	M	8	M07	12	Number	Applying	1	B
M032637A	M	8	M07	13	Data and Chance	Applying	1	See scoring guide
M032637B	M	8	M07	13	Data and Chance	Knowing	1	See scoring guide
M032637C	M	8	M07	13	Data and Chance	Applying	1	See scoring guide

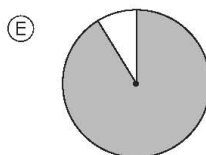
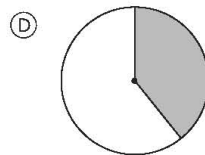
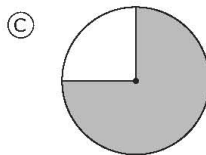
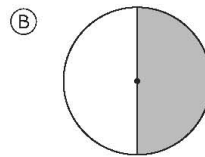
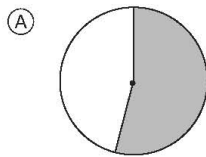
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Mathematics

Eighth Grade



Which circle has approximately the same fraction of its area shaded as the rectangle above?



M022043

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Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

D



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A gardener mixes 4.45 kilograms of rye grass seed with 2.735 kilograms of clover seed to make a mix for sowing a lawn area. How many kilograms of the lawn mix does he now have?

Answer: _____

M022046

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Mathematics

Eighth Grade

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide



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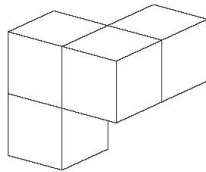
Code	Response	Item: M022046
	Correct Response	
10	7.185	
19	Other responses equivalent to 7.185	
	Incorrect Response	
70	6.780 OR 6.78 [4.045 + 2.735]	
71	Contains one miscalculated digit (<i>e.g., 7.085, 7.195, 8.185 or similar</i>)	
72	One of the following: 3.18, 31.8, 318, OR 3180 [misaligns decimals]	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics

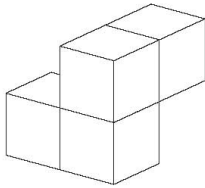
Eighth Grade

This object will be turned to a different position

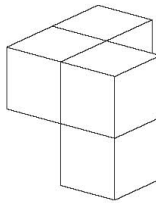


Which of these could be the object after being turned?

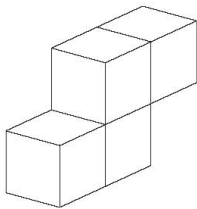
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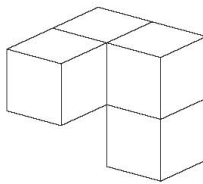
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M022049

Content Domain

Geometry

Cognitive Domain

Reasoning

Maximum Points

1

Key

D

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Mathematics Eighth Grade

$\frac{x}{3} > 8$ is equivalent to

- (A) $x < 5$
- (B) $x < 24$
- (C) $x > \frac{8}{3}$
- (D) $x > 5$
- (E) $x > 24$

M022050

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

E

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TIMSS2007**Mathematics****Eighth Grade**

What is the perimeter of a square whose area is 100 square meters?

Answer: _____

M022055

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Note: There is no distinction made between responses with or without units.

Code	Response	Item: M022055
	Correct Response	
10	40	
	Incorrect Response	
70	25 [100 ÷ 4 sides]	
71	10 [length of 1 side]	
72	100 [10 × 10]	
73	400 [100 × 4 sides]	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics****Eighth Grade**

One year a company reported selling 1426 tons of fertilizer. The following year the company sold 15 percent less fertilizer. Which is the closest approximation to the number of tons of fertilizer sold in the second year?

- (A) 200
- (B) 300
- (C) 1200
- (D) 1600
- (E) 1700

M022057

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

C

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Mathematics Eighth Grade

Content Domain
Data and Chance

Cognitive Domain
Applying

Maximum Points
1

Key
C

A bowl contains 36 colored beads all of the same size: some blue, some green, some red, and the rest yellow. A bead is drawn from the bowl without looking. The probability that it is blue is $\frac{4}{9}$. How many blue beads are in the bowl?

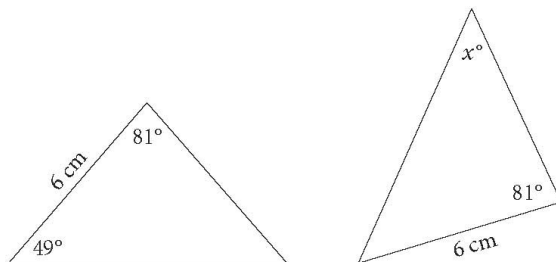
- (A) 4
- (B) 8
- (C) 16
- (D) 18
- (E) 20

M022257

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The triangles shown are congruent. The measures of some of the sides and angles are given. What is the value of x ?

- (A) 49
- (B) 50
- (C) 60
- (D) 70
- (E) 81

M022062

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TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

B



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TIMSS2007

Mathematics Eighth Grade

$$\frac{2}{5} + \frac{5}{4} + \frac{9}{8} =$$

(A) $\frac{16}{17}$

(B) $\frac{41}{40}$

(C) $\frac{81}{40}$

(D) $\frac{111}{40}$

M022066

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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Mathematics

Eighth Grade

Katy made a table to keep track of how long it took water in a beaker to cool from 95°C to 70°C. She measured the time it took the water to cool in 5°C intervals.

Interval Readings	Amount of Cooling Time
95°C – 90°C	2 minutes 10 seconds
90°C – 85°C	3 minutes 19 seconds
85°C – 80°C	4 minutes 48 seconds
80°C – 75°C	6 minutes 55 seconds
75°C – 70°C	9 minutes 43 seconds

Estimate to the nearest minute the total time taken for the temperature of the water in the beaker to cool from 95°C to 70°C, and explain how your estimate was made.

Estimate: _____

Explain:

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

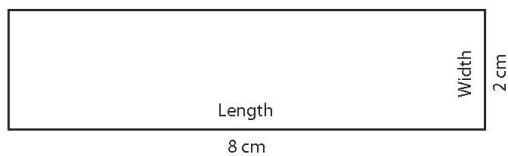
2

Key

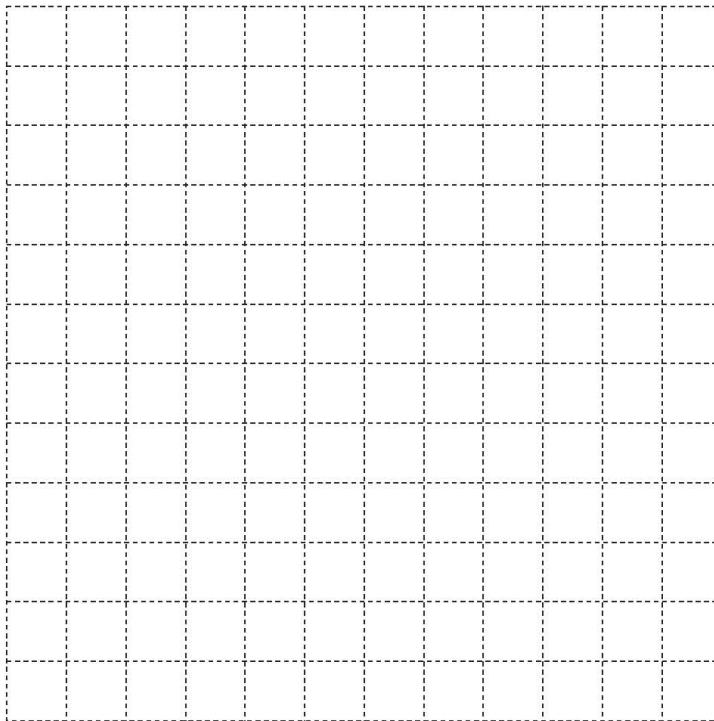
See scoring guide

Note: There is no distinction made between responses with or without units.

Code	Response	Item: M022232
	Correct Response	
20	27 minutes, each amount of time is correctly rounded to whole minutes before adding (e.g., 2 + 3 + 5 + 7 + 10)	
21	27 minutes, each amount of time is correctly rounded to the nearest 5, 10, 15, or 30 seconds	
22	27 minutes, add minutes to equal 24 and uses some approach to estimate seconds to 3 minutes	
23	27 minutes, adds correctly and then rounds off from 26 minutes 55 seconds	
24	27 minutes. No calculations shown. Statements might include “rounded off to the nearest minute”, “rounded the numbers up and down” or similar expressions	
29	Other fully correct	
	Partial Response	
10	Method includes each amount of time correctly rounded to whole minutes before adding but answer is incorrect	
11	Method includes each amount of time correctly rounded to the nearest 5, 10, 15, or 30 seconds but answer is incorrect	
19	Other partially correct including 27 minutes with no explanation or method shown.	
	Incorrect Response	
70	Each amount of time is rounded off, but one or more rounding is incorrect	
71	26 minutes 55 seconds, no rounding	
72	25 minutes 75 seconds, 25.75 minutes; or rounds off from 25.75 minutes (or equivalent)	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	



- A. On the grid below, draw a rectangle whose length is three-fourths the length of the rectangle above, and whose width is two and one-half times the width of the rectangle above. Label the length and width of the new rectangle in centimeters on the figure. Each square on the grid is 1 cm by 1 cm.



- B. What is the ratio of the area of the original rectangle to the area of the new one?

M022234

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Mathematics

Eighth Grade

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

2

Key

See scoring guide



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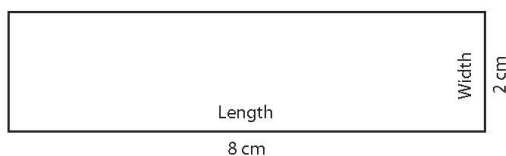
Note: There is no distinction made between responses with or without units.

Code	Response	Item: M022234A
	Correct Response	
20	6 cm and 5 cm. Rectangle is correctly drawn and labeled (on the figure).	
	Partial Response	
10	Rectangle is correctly labeled, 6 cm and 5 cm, but drawing is incorrect.	
11	Correct drawing is shown, but the length and/or width is not labeled or is incorrectly labeled.	
	Incorrect Response	
70	One side is 6 cm and other side is incorrect, explicitly written or implicit from the drawing.	
71	One side is 5 cm and other side is incorrect, explicitly written or implicit from the drawing.	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task). Also includes responses in which the drawing is missing.	
	Nonresponse	
99	Blank	

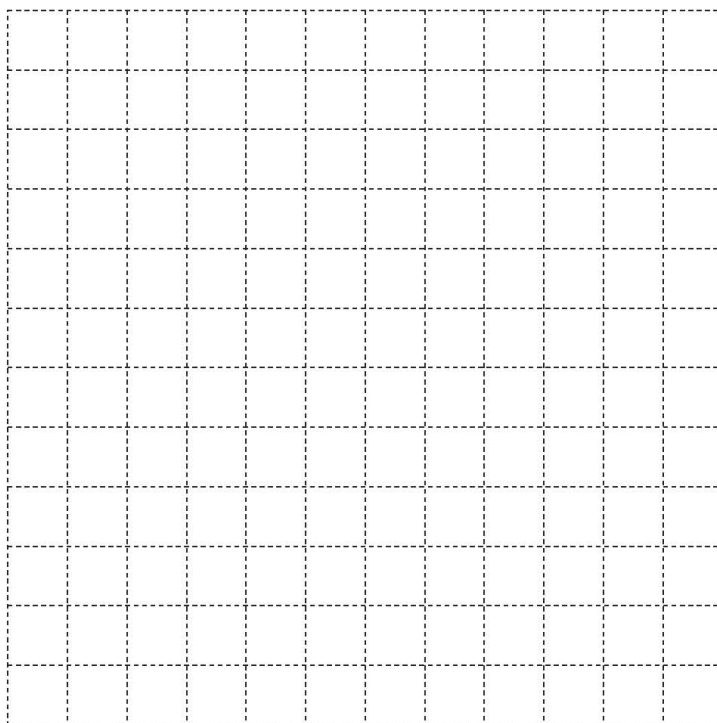
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Mathematics

Eighth Grade



- A. On the grid below, draw a rectangle whose length is three-fourths the length of the rectangle above, and whose width is two and one-half times the width of the rectangle above. Label the length and width of the new rectangle in centimeters on the figure. Each square on the grid is 1 cm by 1 cm.



- B. What is the ratio of the area of the original rectangle to the area of the new one?

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

2

Key

See scoring guide

M022234

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Note: There is no distinction made between responses with or without units.

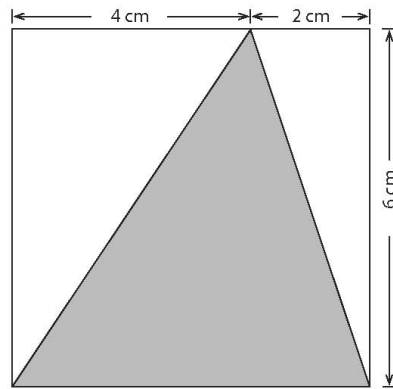
Code	Response	Item: M022234B
Correct Response		
20	8:15, $\frac{8}{15}$ or equivalent (e.g., $\frac{16}{30}$).	
21	The ratio is not 8:15 but the ratio of part b is consistent with response in part a.	
Partial Response		
10	15:8 or equivalent [ratio of new to original].	
11	Gives ratio of new rectangle to original rectangle. The ratio is not 15:8 but the ratio of part b is consistent.	
19	Other partially correct including correct ratio given but incorrectly reduced (e.g., $\frac{16}{30} = \frac{3}{10}$).	
Incorrect Response		
70	Focuses exclusively on the ratios of lengths and/or widths between or within the rectangles.	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task). Also includes multiplication of ratio of lengths and widths.	
Nonresponse		
99	Blank	

TIMSS2007

Mathematics

Eighth Grade

The figure shows a shaded triangle inside a square.



What is the area of the shaded triangle?

Answer: _____

M022243

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Note: There is no distinction made between responses with or without units.

Code	Response	Item: M022243
	Correct Response	
10	18	
	Incorrect Response	
70	36	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics****Eighth Grade**

Which group of numbers is ordered from LARGEST to SMALLEST?

- (A) 10,011; 10,110; 11,001; 11,100
- (B) 10,110; 10,011; 11,100; 11,001
- (C) 11,001; 11,100; 10,110; 10,011
- (D) 11,100; 11,001; 10,110; 10,011

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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M042079

What is the value of 3.4×10^2 ?

- (A) 3.4
- (B) 34
- (C) 340
- (D) 3400

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Mathematics
Eighth Grade

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

C

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TIMSS2007**Mathematics****Eighth Grade**

Place either + or – into each box so that this expression has the largest possible total.

$$-5 \square -6 \square 3 \square -9$$

M042018

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M042018
	Correct Response	
10	−, +, −	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics****Eighth Grade**

There are 30 students in a class. The ratio of boys to girls in the class is 2:3.
How many boys are there in the class?

- (A) 6
- (B) 12
- (C) 18
- (D) 20

M042055

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

B

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TIMSS2007

Mathematics Eighth Grade

M042039

A coat normally costs 60 zeds. Alan bought the coat when the price was reduced by 30%. How much did Alan save?

- (A) 18 zeds
- (B) 24 zeds
- (C) 30 zeds
- (D) 42 zeds

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

A

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Which is equivalent to $4x - x + 7y - 2y$?

- Ⓐ 9
- Ⓑ $9xy$
- Ⓒ $4 + 5y$
- Ⓓ $3x + 5y$

M042199

TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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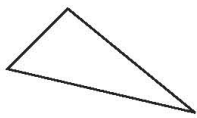
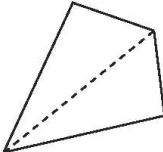
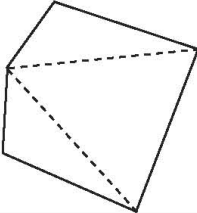
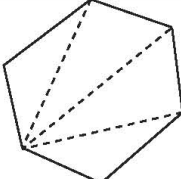


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Interior Angles

Jackson was investigating the properties of polygons. Jackson made up the table below to see if he could find a connection between sides and angles.

A. Complete the table by filling in the blank spaces.

Polygon	Number of Sides	Number of Triangles	Sum of Interior Angles
	3	1	$1 \times 180^\circ$
	—	—	— $\times 180^\circ$
	—	—	— $\times 180^\circ$
	—	—	— $\times 180^\circ$

B. Put the correct number into the box.

The sum of the interior angles of a polygon with 10 sides = $\times 180^\circ$

TIMSS2007

Mathematics

Eighth Grade

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

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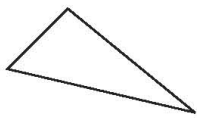
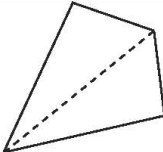
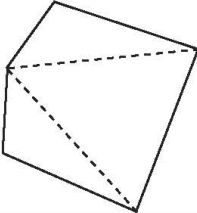
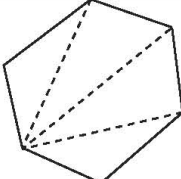
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Code	Response	Item: M042301A
	Correct Response	
10	All entries correct 4 2 2 5 3 3 6 4 4	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Interior Angles

Jackson was investigating the properties of polygons. Jackson made up the table below to see if he could find a connection between sides and angles.

A. Complete the table by filling in the blank spaces.

Polygon	Number of Sides	Number of Triangles	Sum of Interior Angles
	3	1	$1 \times 180^\circ$
	—	—	— $\times 180^\circ$
	—	—	— $\times 180^\circ$
	—	—	— $\times 180^\circ$

B. Put the correct number into the box.

The sum of the interior angles of a polygon with 10 sides = $\times 180^\circ$

TIMSS2007

Mathematics

Eighth Grade

Content Domain

Algebra

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M042301B
	Correct Response	
10	8	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

M042301_2

C. Jackson could see a pattern and was able to write an expression using n that is true for any polygon. Complete what he wrote.

Sum of the interior angles of a polygon with n sides = _____ $\times 180^\circ$

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Mathematics Eighth Grade

Content Domain

Algebra

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide



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Code	Response	Item: M042301C
	Correct Response	
10	$n - 2$ with or without brackets	
	Incorrect Response	
70	n or verbal equivalent	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics Eighth Grade

Content Domain

Algebra

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

Joe knows that a pen costs 1 zed more than a pencil.
His friend bought 2 pens and 3 pencils for 17 zeds.
How many zeds will Joe need to buy 1 pen and 2 pencils?

Show your work.

M042263

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Code	Response	Item: M042263
	Correct Response	
10	10 zeds and equation(s) shown. Equations should involve the use of letter(s) as variable(s), e.g., $2y + 3x = 17$.	
11	10 zeds and other work shown, e.g., pen = pencil + 1	
	Incorrect Response	
70	10 zeds, no work shown	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

M042265

Which net when folded forms a cube?

(A)

(B)

(C)

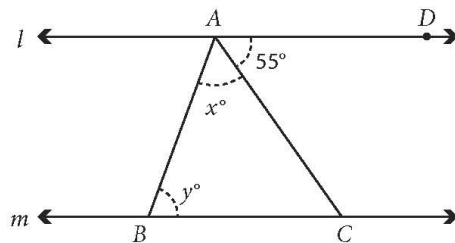
(D)

TIMSS2007

Mathematics Eighth Grade

Content Domain
Geometry
Cognitive Domain
Reasoning
Maximum Points
1
Key
C

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In this figure, line l is parallel to line m . The measure of angle DAC is 55° . What is the value of $x + y$?

- (A) 55
- (B) 110
- (C) 125
- (D) 135

M042137

TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Geometry

Cognitive Domain

Applying

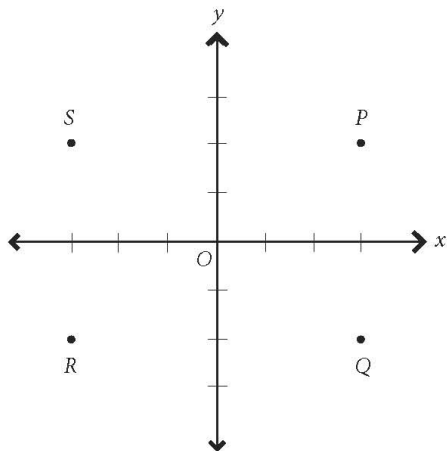
Maximum Points

1

Key

C

Mathematics
Eighth Grade



Which of the following represents the point (3, -2) on the graph?

- (A) P
- (B) Q
- (C) R
- (D) S

Content Domain
Geometry

Cognitive Domain
Knowing

Maximum Points
1

Key
B

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TIMSS2007

Mathematics

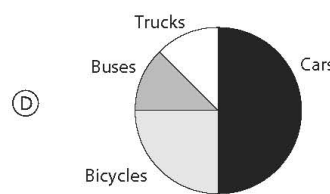
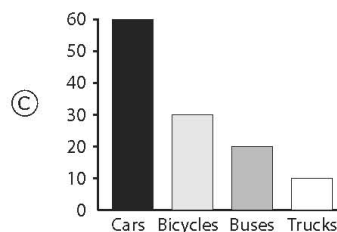
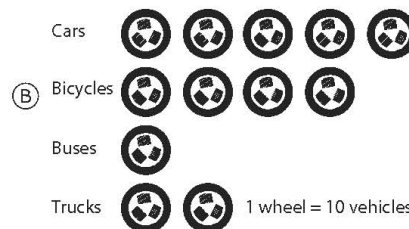
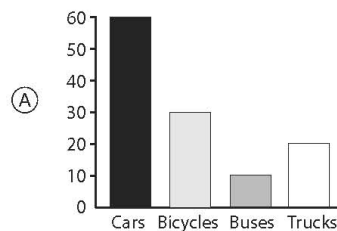
Eighth Grade

Four students watched the traffic passing their school for 1 hour.

The table shows what they saw:

Type of Vehicle	Number
Cars	60
Bicycles	30
Buses	10
Trucks	20

Each student drew a graph to show the results. Which graph shows the results correctly?



Content Domain

Data and Chance

Cognitive Domain

Applying

Maximum Points

1

Key

A

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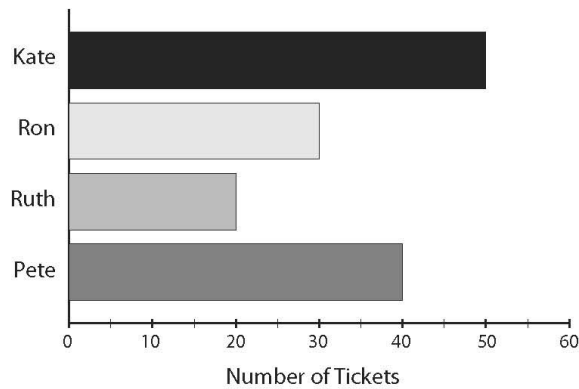
Mathematics Eighth Grade

Content Domain
Data and Chance

Cognitive Domain
Knowing

Maximum Points
1

Key
See scoring guide



Kate, Ron, Ruth, and Pete sold tickets for the school concert. The graph shows the number of tickets each sold. Two people together sold the same number of tickets as Kate sold. Who were they?

Answer: _____ and _____

M042250

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Code	Response	Item: M042250
	Correct Response	
10	Ruth and Ron	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Mathematics
Eighth Grade

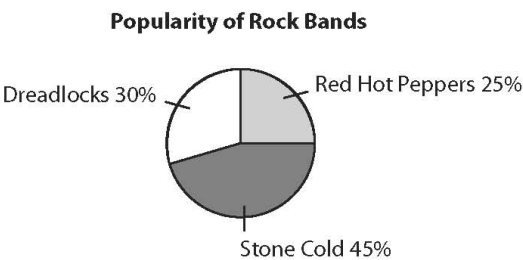
Content Domain
Data and Chance

Cognitive Domain
Applying

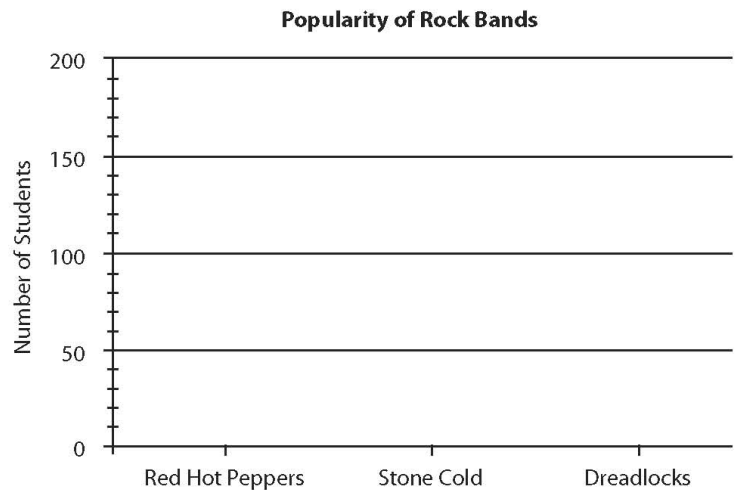
Maximum Points
2

Key
See scoring guide

The results of a survey of 200 students are shown in the pie chart.



Make a bar chart showing the number of students in each category in the pie chart.



Code	Response	Item: M042220
	Correct Response	
20	All three correct - (50, 90, 60) 50 should be to the correct line. 90 should be less than 100 but greater than 80. 60 should be less than 70 but greater than 50.	
	Partially Correct Response	
10	Any two correct	
	Incorrect Response	
70	Bars drawn as percentages not actual numbers	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

A car salesman placed this advertisement in the newspaper: "Old and new cars for sale, different prices, average price 5,000 zeds." From the advertisement, which of the following must be true?

- (A) Most of the cars would cost between 4,000 zeds and 6,000 zeds.
- (B) Half of the cars would cost less than 5,000 zeds, and half would cost more than 5,000 zeds.
- (C) At least one of the cars would cost 5,000 zeds.
- (D) Some of the cars would cost less than 5,000 zeds.

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Mathematics

Eighth Grade

Content Domain

Data and Chance

Cognitive Domain

Reasoning

Maximum Points

1

Key

D



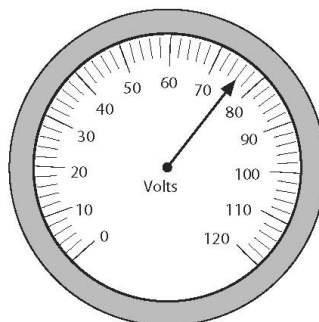
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TIMSS2007

Mathematics Eighth Grade

What is the voltage reading shown on the meter?

- (A) 73
- (B) 74
- (C) 76
- (D) 78



Content Domain
Number

Cognitive Domain
Knowing

Maximum Points
1

Key
C

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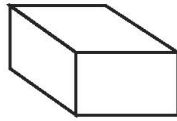


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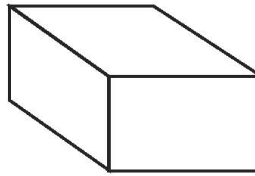
TIMSS2007

Mathematics
Eighth Grade

The smaller box contains 20 tickets numbered from 1 to 20. The larger box contains 100 tickets numbered from 1 to 100.



20 tickets



100 tickets

Without looking at them, you can pick a ticket from either box. Which box would give you the greater chance of picking out a ticket with the number 17 on it?

- Ⓐ The box with 20 tickets
- Ⓑ The box with 100 tickets
- Ⓒ Both boxes would give the same chance
- Ⓓ It is impossible to tell

M022101

Content Domain
Data and ChanceCognitive Domain
Knowing

Maximum Points

1

Key

A

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Which of the following numbers is SMALLEST?

- (A) $\frac{1}{2}$
- (B) $\frac{5}{8}$
- (C) $\frac{5}{6}$
- (D) $\frac{5}{12}$

M022104

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TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

D



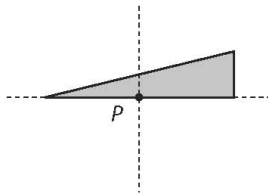
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TIMSS2007

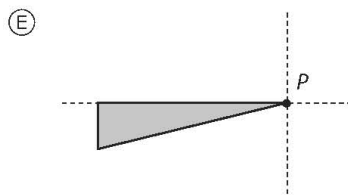
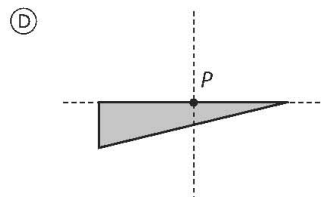
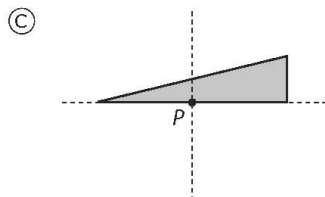
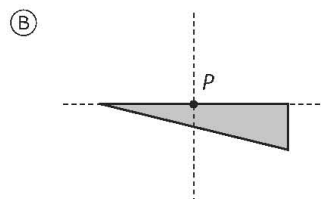
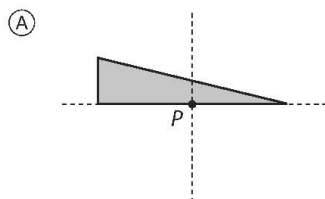
Mathematics

Eighth Grade

A half-turn about point P in the plane is applied to the shaded figure.



Which of the following shows the results of the half-turn?



M022105

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Content Domain

Geometry

Cognitive Domain

Knowing

Maximum Points

1

Key

D



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There are 36 passengers on a bus. The ratio of children to adults on the bus is 5 to 4. How many children are on the bus?

Answer: _____

M022106

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Mathematics

Eighth Grade

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide



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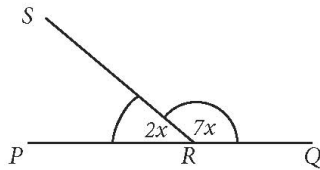
Code	Response	Item: M022106
	Correct Response	
10	20	
	Incorrect Response	
70	9	[5 + 4 or 36 ÷ 4]
71	16	[number of adults]
72	5	[ratio of children]
73	27	[36 – 9]
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics

Eighth Grade

In this figure PQ is a straight line.



What is the degree measure of angle PRS ?

- (A) 10°
- (B) 20°
- (C) 40°
- (D) 70°
- (E) 140°

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

C

M022110

Multiply: $0.402 \times 0.53 =$

Answer: _____

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TIMSS2007**Mathematics**
Eighth Grade**Content Domain**

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M022110
	Correct Response	
10	0.21306	
11	0.21306 is shown as part of student's work and then rounded either correctly or incorrectly	
	Incorrect Response	
70	2.1306, 21.306, 21306, 0.021306, or other response in which error is a misplaced decimal point	
71	0.213 or 0.21 or other rounded response but 0.21306 is not shown	
72	0.03216, 0.3216, 3.216 or other response in which error is misalignment of numbers when multiplying	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Mathematics
Eighth Grade

Content Domain
Data and Chance

Cognitive Domain
Applying

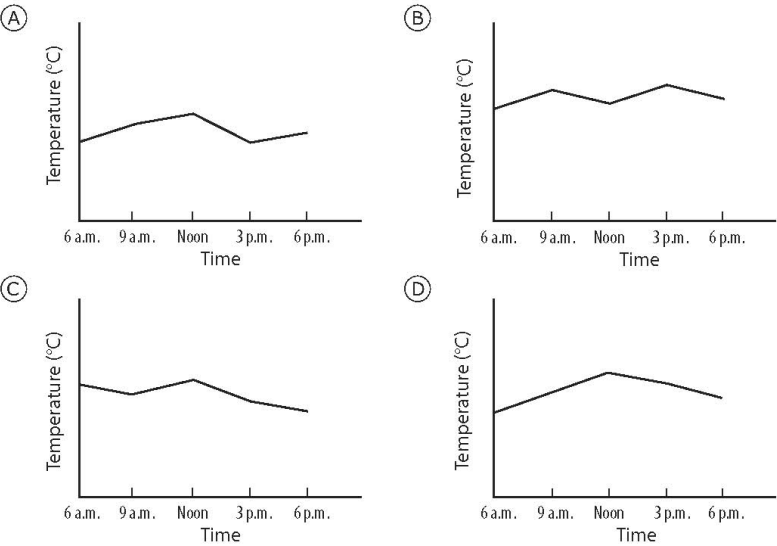
Maximum Points
1

Key
B

The table shows the temperatures at various times on a certain day.

Time	6 a.m.	9 a.m.	Noon	3 p.m.	6 p.m.
Temperature °C	12	17	14	18	15

A graph, without a temperature scale, is drawn. Of the following, which could be the graph that shows the information given in the table?



TIMSS2007**Mathematics****Eighth Grade**

Tickets for a concert cost either 10 zeds, 15 zeds, or 30 zeds.

Of the 900 tickets sold, $\frac{1}{5}$ cost 30 zeds each and $\frac{2}{3}$ cost 15 zeds each.

What FRACTION of the tickets sold for 10 zeds each?

Answer: _____

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M032307
	Correct Response	
10	$\frac{2}{15}$ or equivalent	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics

Eighth Grade

Dana makes a large batch of cranberry bread that is one and a half times the original recipe. If the original recipe requires $\frac{3}{4}$ cup of sugar, how many cups of sugar are required for the bread Dana is making?

- (A) $\frac{3}{8}$
- (B) $1\frac{1}{8}$
- (C) $1\frac{1}{4}$
- (D) $1\frac{3}{8}$

M032523

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

B

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TIMSS2007**Mathematics****Eighth Grade**

On a school trip there was 1 teacher for every 12 students. If 108 students went on the trip, how many teachers were on the trip?

- (A) 7
- (B) 8
- (C) 9
- (D) 10

M032701

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

C

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A bus travels at a constant speed so that the distance traveled is directly proportional to the time spent traveling. If the bus travels 120 km in 5 hours, how many kilometers does it travel in 8 hours?

- (A) 168
- (B) 192
- (C) 200
- (D) 245

M032704

TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Number

Cognitive Domain

Applying

Maximum Points

1

Key

B

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TIMSS2007

Mathematics Eighth Grade

M032525

What number divided by -6 gives 12 as the result?

- (A) -72
- (B) -2
- (C) 2
- (D) 72

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

A

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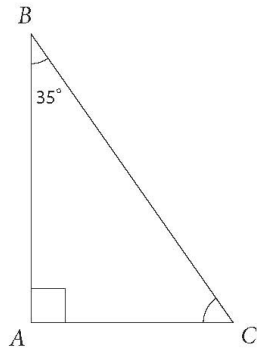


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TIMSS2007

Mathematics

Eighth Grade



What is the measure of angle C in the triangle above?

- (A) 45°
- (B) 55°
- (C) 65°
- (D) 145°

M032579

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

B

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Using line segment AO below, draw a straight line BC through O such that angle AOB is acute and angle AOC is obtuse. Label points B and C .



M032691

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TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide



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Code	Response	Item: M032691
	Correct Response	
10	Line drawn through O; acute angle and obtuse angle correct and labeled	
	Incorrect Response	
70	Line drawn through O but not labeled	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Non response	
99	Blank	

M042001

Which of the numbers below is ten million twenty thousand thirty?

- (A) 102,030
- (B) 10,020,030
- (C) 10,200,030
- (D) 102,000,030

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TIMSS2007

Mathematics

Eighth Grade

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

B



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TIMSS2007

Mathematics

Eighth Grade

M042022

Which of these shows 1080 as the product of prime factors?

- (A) $1080 = 8 \times 27 \times 5$
- (B) $1080 = 2 \times 4 \times 3 \times 9 \times 5$
- (C) $1080 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5$
- (D) $1080 = 2^2 \times 3^2 \times 6 \times 5$

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

C

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M042082

$a = 3$ and $b = -1$.

What is the value of $2a + 3(2 - b)$?

- (A) 15
- (B) 14
- (C) 13
- (D) 9

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TIMSS2007

Mathematics

Eighth Grade

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

A



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TIMSS2007

Mathematics

Eighth Grade


 x meters

The first pipe is x meters long. The second pipe is y times as long as the first one. How long is the second pipe?

- Ⓐ xy meters
- Ⓑ $x + y$ meters
- Ⓒ $\frac{x}{y}$ meters
- Ⓓ $\frac{y}{x}$ meters

M042088

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

A

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Lynch School of Education, Boston College

TIMSS2007**Mathematics**
Eighth Grade**Triathlon**

A triathlon is a race in which athletes swim, then cycle, then run set distances. The first person to complete the whole course is the winner.

Kathy, Barbara, and Sue competed with each other in a triathlon. The course they covered consisted of a 1 kilometer swim, followed by a 40 kilometer cycle ride, and then a 15 kilometer run.

- A. Barbara was the fastest swimmer and completed the 1 km distance in 25 minutes. Kathy took 10 minutes longer than Barbara, and Sue took 5 minutes longer than Kathy.

Use this information to complete the table for swimming:

Swimming	Kathy	Barbara	Sue
Time taken (minutes)		25	

- B. Kathy was the fastest cyclist. She averaged 30 kilometers per hour for the 40 km ride. Barbara took 10 minutes more than Kathy, and Sue took 15 minutes more than Kathy.

Use this information to complete the table for cycling:

Cycling	Kathy	Barbara	Sue
Time taken (minutes)			

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M042304A
	Correct Response	
10	Kathy 35, Sue 40	
	Incorrect Response	
70	Kathy 35, Sue 30	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics
Eighth Grade**Triathlon**

A triathlon is a race in which athletes swim, then cycle, then run set distances. The first person to complete the whole course is the winner.

Kathy, Barbara, and Sue competed with each other in a triathlon. The course they covered consisted of a 1 kilometer swim, followed by a 40 kilometer cycle ride, and then a 15 kilometer run.

- A. Barbara was the fastest swimmer and completed the 1 km distance in 25 minutes. Kathy took 10 minutes longer than Barbara, and Sue took 5 minutes longer than Kathy.

Use this information to complete the table for swimming:

Swimming	Kathy	Barbara	Sue
Time taken (minutes)		25	

- B. Kathy was the fastest cyclist. She averaged 30 kilometers per hour for the 40 km ride. Barbara took 10 minutes more than Kathy, and Sue took 15 minutes more than Kathy.

Use this information to complete the table for cycling:

Cycling	Kathy	Barbara	Sue
Time taken (minutes)			

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

2

Key

See scoring guide

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Code	Response	Item: M042304B
	Correct Response	
20	Kathy 80, Barbara 90, Sue 95 (accept time given in hours and minutes)	
	Partially Correct Response	
10	Barbara 10 more than value for Kathy; Sue 15 more than value for Kathy	
11	Kathy 80, at least one of others not given or incorrect.	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics**
Eighth Grade

- C. Sue was the fastest runner. She averaged 7.5 km per hour for the 15 km run. Barbara took 10 minutes more than Sue, and Kathy took 5 minutes more than Barbara.

Use this information to complete the table for running:

Running	Kathy	Barbara	Sue
Time taken (minutes)			

- D. Complete the table to show the total time each person took to finish the triathlon.

Triathlon	Kathy	Barbara	Sue
Time taken (minutes)			

Who won the triathlon?

Answer: _____

M042304_2

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M042304C
	Correct Response	
10	Kathy 135, Barbara 130, Sue 120 (accept time given in hours and minutes)	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics****Eighth Grade**

- C. Sue was the fastest runner. She averaged 7.5 km per hour for the 15 km run. Barbara took 10 minutes more than Sue, and Kathy took 5 minutes more than Barbara.

Use this information to complete the table for running:

Running	Kathy	Barbara	Sue
Time taken (minutes)			

- D. Complete the table to show the total time each person took to finish the triathlon.

Triathlon	Kathy	Barbara	Sue
Time taken (minutes)			

Who won the triathlon?

Answer: _____

M042304_2

Content Domain

Number

Cognitive Domain

Reasoning

Maximum Points

2

Key

See scoring guide

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Code	Response	Item: M042304D
	Correct Response	
20	250, 245, 255 - won by Barbara (accept time given in hours and minutes)	
21	All three table entries consistent with results given by the student in A, B, and C. Winner chosen is the person with the shortest time according to the student's table.	
	Partially Correct Response	
10	All three table entries correctly calculated, but no winner indicated or Sue (longer time) indicated as winner.	
11	One of three table entries incorrectly calculated but winner chosen is the person in the student's table with the shortest time.	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Part	Code	Kathy	Barbara	Sue
A	10	35	(25)	40
B	20	80 (1hr 20 min)	90 (1 hr 30 min)	95 (1 hr 35 min)
	10	Wrong	Kathy + 10	Kathy + 15
	11	80	One or both incorrect	
C	10	135 (2 hr 15 min)	130 (2 hr 10 min)	120 (2 hr)
D	20	250 (4 hr 10 min)	245 (4 hr 5 min)	255 (4 hr 15 min)
	21	See scoring guide above		
	10			
	11			

In Zedland, total shipping charges to ship an item are given by the equation $y = 4x + 30$, where x is the weight in grams and y is the cost in zeds. If you have 150 zeds, how many grams can you ship?

- (A) 630
- (B) 150
- (C) 120
- (D) 30

M042267

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TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Algebra

Cognitive Domain

Applying

Maximum Points

1

Key

D



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TIMSS2007**Mathematics****Eighth Grade**

Which of these is equal to $2(x + y) - (2x - y)$?

- (A) $3y$
- (B) y
- (C) $4x + 3y$
- (D) $4x + 2y$

M042239

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

A

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TIMSS2007

Mathematics

Eighth Grade

M042238

Which point is on the line $y = x + 2$?

- (A) $(0, -2)$
- (B) $(2, -4)$
- (C) $(4, 6)$
- (D) $(6, 4)$

Content Domain

Algebra

Cognitive Domain

Applying

Maximum Points

1

Key

C

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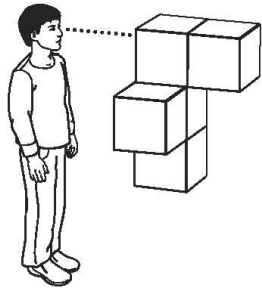


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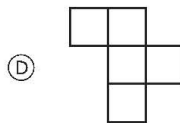
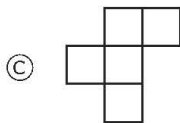
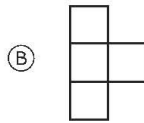
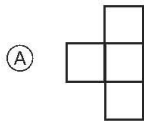
TIMSS2007

Mathematics

Eighth Grade



The solid is made of 5 small cubes.
Which shape does the person in the diagram see?



M042279

Content Domain

Geometry

Cognitive Domain

Reasoning

Maximum Points

1

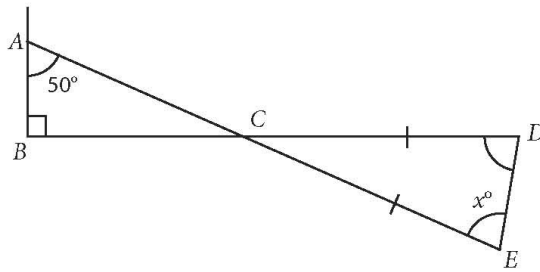
Key

B

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In this diagram, $CD = CE$.
What is the value of x ?

- (A) 40
- (B) 50
- (C) 60
- (D) 70

M042036

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TIMSS2007

Mathematics Eighth Grade

Content Domain

Geometry

Cognitive Domain

Reasoning

Maximum Points

1

Key

D



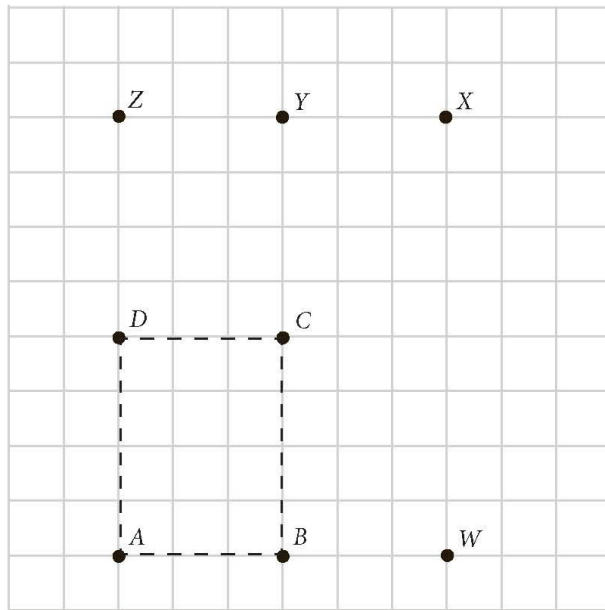
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TIMSS2007

Mathematics

Eighth Grade

Using the marked points, draw a triangle having an area TWICE that of the rectangle $ABCD$.



Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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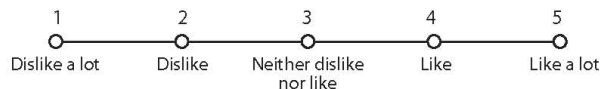
Code	Response	Item: M042130
	Correct Response	
10	Using marked points, draw a triangle with area 24 square units. For example, AZW, ZWX, XAW, XZA, AYW, BZX, and XWD.	
	Incorrect Response	
70	Triangle with area 12 square units drawn	
79	Other Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics
Eighth Grade

Popularity of Subjects

A group of 10 students wanted to find out whether mathematics or history was more popular for their group. They rated each subject using the following scale.



The table shows the results:

Students' Ratings

Student	Mathematics Rating	History Rating
Alan	1	2
Lisa	4	4
Ann	5	4
John	2	2
Connor	4	2
Georgia	3	3
Bret	2	1
Courtney	1	1
Ian	5	3
Jackson	3	2
Totals	30	24

A. Calculate the mean (average) rating for each subject.

Mean rating for mathematics = _____

Mean rating for history = _____

According to the ratings, which is the more popular subject for this group of students?

More popular subject: _____

Content Domain
Data and Chance

Cognitive Domain
Knowing

Maximum Points

1

Key

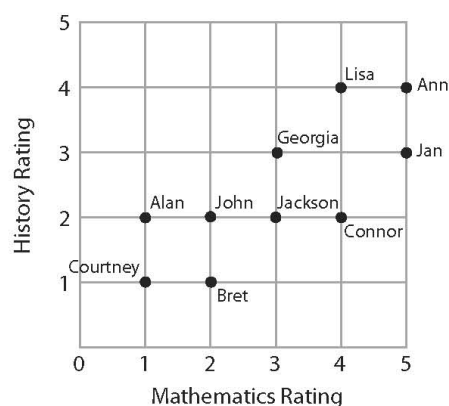
See scoring guide

M042303_1

Code	Response	Item: M042303A
	Correct Response	
10	3.0 or 3 for mathematics 2.4 for history mathematics more popular	
	Incorrect Response	
70	Correct means, no subject chosen	
71	3.0 for mathematics OR 2.4 for history, not both.	
79	Other incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics**
Eighth Grade

B. The students' ratings are shown on the graph below. For example, Alan's name is by his ratings (mathematics 1, history 2).



Write True or False in the space after each of these statements:

All students in the group liked mathematics more than they liked history. _____

Nearly half of the students gave both subjects the same rating. _____

Two students neither liked nor disliked either subject. _____

Content Domain
Data and Chance

Cognitive Domain
Reasoning

Maximum Points

2

Key

See scoring guide

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Code	Response	Item: M042303B
	Correct Response	
20	False True False	
	Partially Correct Response	
10	Two of the responses correct.	
	Incorrect Response	
79	Incorrect (including crossed out, erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Sophie has a bag in which there are 16 marbles: 8 are red and 8 are black marbles. She draws 2 marbles from the bag and does not put them back. Both marbles are black. She then draws a third marble out of the bag. What can you say about the likely color of this third marble?

- Ⓐ It is more likely to be red than black.
- Ⓑ It is more likely to be black than red.
- Ⓒ It is equally likely to be red or black.
- Ⓓ You cannot tell if red or black is more likely.

TIMSS2007**Mathematics****Eighth Grade****Content Domain**

Data and Chance

Cognitive Domain

Knowing

Maximum Points

1

Key

A

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TIMSS2007

Mathematics
Eighth Grade

Class	Boys	Girls
1	12	9
2	14	11
3	16	12
4	18	15

The table above shows the numbers of boys and girls in four classes. Which two classes have the same ratio of boys to girls?

- Ⓐ 1 and 2
- Ⓑ 1 and 3
- Ⓒ 2 and 3
- Ⓓ 2 and 4

Content Domain
Number

Cognitive Domain
Applying

Maximum Points
1

Key
B

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TIMSS2007**Mathematics****Eighth Grade**

$$2a^2 \times 3a =$$

- (A) $5a^2$
(B) $5a^3$
(C) $6a^2$
(D) $6a^3$

M032198

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

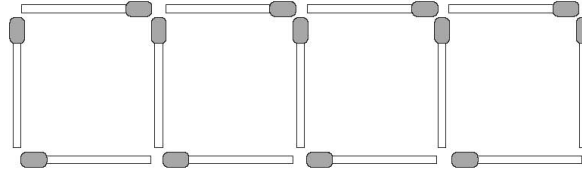
Key

D

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In the figure, 13 matches were used to make 4 squares in a row. What is the number of squares in a row that can be made in this way using 73 matches? Show the calculations that lead to your answer.

Answer: _____

M032640

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TIMSS2007

Mathematics Eighth Grade

Content Domain

Algebra

Cognitive Domain

Reasoning

Maximum Points

2

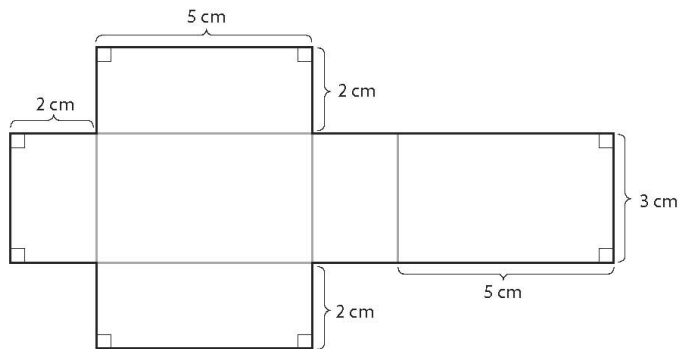
Key

See scoring guide



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Code	Response	Item: M032640
	Correct Response	
20	24 with calculations	
	Partial Response	
10	24 with no calculations or no relevant calculations (includes only drawing and counting squares)	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible or off task)	
	Nonresponse	
99	Blank	



When the shape shown above is folded up, it will make a rectangular box.
What is the volume of the box?

Answer: _____ cm^3

M032344

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TIMSS2007

Mathematics Eighth Grade

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

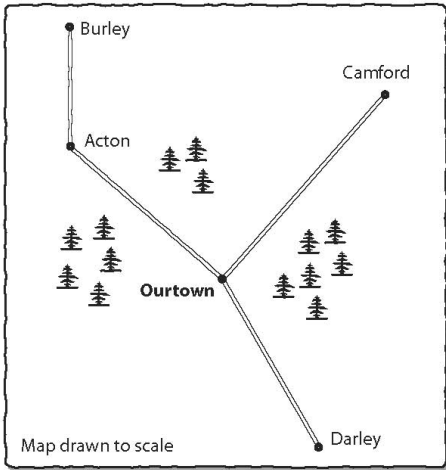


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Code	Response	Item: M032344
	Correct Response	
10	30 or equivalent	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

Mathematics
Eighth Grade

Mike and Katy are planning a day trip for their class.
They plan to go from their school in Ourtown to one of the towns of Acton, Burley, Camford, or Darley.



MP32754

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Content Domain	
Cognitive Domain	
Maximum Points	
Key	

TIMSS2007**Mathematics****Eighth Grade**

Since the teacher said they must return on the same day, the class cannot travel to a town that is more than 80 km from Ourtown. Given that it is 80 km from Ourtown to Camford, use the map above to help you complete the table below by entering Yes or No in the blank spaces.

	Acton	Burley	Camford	Darley
Meets condition of 80 km or less			Yes	

Questions for Class Trip continue. ➡

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M032754
	Correct Response	
10	Acton – Yes; Burley – No; Darley - Yes	
	Incorrect Response	
70	2 out of 3 correct	
79	Other Incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics Eighth Grade

Content Domain

Number

Cognitive Domain

Reasoning

Maximum Points

2

Key

See scoring guide

The total cost of the journey for all the students must be 500 zeds or less.
There are 30 students in the class.

Here are the costs for visiting each town:

Visiting Acton or Camford Student Rate

Round-trip ticket: 25 zeds

$\frac{1}{3}$ off for groups of 25
or more students

Visiting Burley or Darley Student Rate

Round-trip ticket: 20 zeds

10% off for groups of
15 or more students

Which towns can they afford to visit? Show your work.

Questions for Class Trip continue. ➔

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Code	Response	Item: M032755
	Correct Response	
20	Show costs of 500 zeds for Acton and Camford; 540 zeds for Burley and Darley; Indicates Acton and Camford	
	Partially Correct Response	
10	Shows 500 zeds for Acton and Camford; 540 zeds for Burley and Darley; does not indicate Acton and Camford	
11	Finds correct cost for visiting Acton and Camford (500 zeds) or Burley and Darley (540 zeds) but not both	
	Incorrect Response	
70	Indicates Acton and Camford but no calculations or incorrect calculations shown	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics**
Eighth Grade**Content Domain**

Data and Chance

Cognitive Domain

Reasoning

Maximum Points

2

Key

See scoring guide

The teacher also said that three scheduling conditions must be met for the trip. They are as follows:

1. We must leave Ourtown at 9 a.m. or later;
2. We must be back at Ourtown by 5 p.m.;
3. We must stay at the town we visit for at least 3 hours.

Mike and Katy used the bus timetables to find out if they could meet the teacher's conditions. They started putting the information in the table below but they did not complete it.

- A. Use the information in the bus timetables on the opposite page to complete the table below for Acton.
- B. Use the information in the bus timetables on the opposite page to complete the table below for Camford.

Trip to...	Best Bus Times					Teacher's Conditions		
	Leave Ourtown at...	Arrive destination at...	Depart for return to Ourtown...	Arrive back in Ourtown at...	Time in town visited	Leave 9 am or later	Stay at least 3 hours	Back by 5 pm
Acton	9:00 am	11:15 am						
Burley	9:15 am	12:20 pm	2:30 pm	5:35 pm	2 hr 10 min	Yes	No	No
Camford	9:25 am							
Darley	9:10 am	11:15 am	2:40 pm	4:45 pm	3 hr 25 min	Yes	Yes	Yes

This Class Trip question continues on the next page. ➡



Code	Response	Item: M032753A												
	Correct Response													
20	Times correct: 2:30, 4:45 Duration correct: 3h 15m Yes/No's correct: Yes, Yes, Yes													
	Partially Correct Response													
10	Complete set of entries in table for Acton, some information correct and some incorrect or inconsistent. Acceptable types of responses are detailed in the table below. <table border="1"> <thead> <tr> <th>Times</th><th>Duration</th><th>Yes/No</th></tr> </thead> <tbody> <tr> <td>Correct Times</td><td>Duration inconsistent with times noted in table</td><td>Consistent with times and duration noted in table</td></tr> <tr> <td>Incorrect Times</td><td>Duration consistent with incorrect times noted in table</td><td>Consistent with times and duration noted in table</td></tr> <tr> <td>Correct Times</td><td>Correct duration</td><td>Inconsistent with times and durations noted in table</td></tr> </tbody> </table> <p><i>Example:</i> Student indicated correct times but calculated the duration incorrectly. Student follows through with yes/no's consistent with the correct times and incorrect duration.</p>		Times	Duration	Yes/No	Correct Times	Duration inconsistent with times noted in table	Consistent with times and duration noted in table	Incorrect Times	Duration consistent with incorrect times noted in table	Consistent with times and duration noted in table	Correct Times	Correct duration	Inconsistent with times and durations noted in table
Times	Duration	Yes/No												
Correct Times	Duration inconsistent with times noted in table	Consistent with times and duration noted in table												
Incorrect Times	Duration consistent with incorrect times noted in table	Consistent with times and duration noted in table												
Correct Times	Correct duration	Inconsistent with times and durations noted in table												
	Incorrect Response													
70	Entries provided in table but do not meet the criteria specified in Code 10													
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)													
	Nonresponse													
99	Blank													

TIMSS2007

Mathematics Eighth Grade

Content Domain
Data and Chance

Cognitive Domain
Reasoning

Maximum Points
2

Key
See scoring guide

The teacher also said that three scheduling conditions must be met for the trip. They are as follows:

1. We must leave Ourtown at 9 a.m. or later;
2. We must be back at Ourtown by 5 p.m.;
3. We must stay at the town we visit for at least 3 hours.

Mike and Katy used the bus timetables to find out if they could meet the teacher's conditions. They started putting the information in the table below but they did not complete it.

- A. Use the information in the bus timetables on the opposite page to complete the table below for Acton.
- B. Use the information in the bus timetables on the opposite page to complete the table below for Camford.

Trip to...	Best Bus Times					Teacher's Conditions		
	Leave Ourtown at...	Arrive destination at...	Depart for return to Ourtown...	Arrive back in Ourtown at...	Time in town visited	Leave 9 am or later	Stay at least 3 hours	Back by 5 pm
Acton	9:00 am	11:15 am						
Burley	9:15 am	12:20 pm	2:30 pm	5:35 pm	2 hr 10 min	Yes	No	No
Camford	9:25 am							
Darley	9:10 am	11:15 am	2:40 pm	4:45 pm	3 hr 25 min	Yes	Yes	Yes

This Class Trip question continues on the next page. ➡

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Code	Response	Item: M032753B												
	Correct Response													
20	Times correct: 11.40, 2.35, 4.50 Duration: 2h 55m Yes/No's: Yes, No, Yes													
21	Times correct: 11.40, 3.35, 5.50 Duration: 3h 55m Yes/No's: Yes, Yes, No													
	Partially Correct Response													
10	Complete set of entries in the table for Camford, some information correct and some incorrect or inconsistent. <table border="1" data-bbox="349 676 1347 976"> <thead> <tr> <th>Times</th><th>Duration</th><th>Yes/No</th></tr> </thead> <tbody> <tr> <td>Correct Times</td><td>Duration inconsistent with times noted in table</td><td>Consistent with times and duration noted in table</td></tr> <tr> <td>Incorrect Times</td><td>Duration consistent with incorrect times noted in table</td><td>Consistent with times and duration noted in table</td></tr> <tr> <td>Correct Times</td><td>Correct duration</td><td>Inconsistent with times and durations noted in table</td></tr> </tbody> </table> <p><i>Example:</i> Student indicated correct times but calculated the duration incorrectly. Student follows through with yes/no's consistent with the correct times and incorrect duration.</p>		Times	Duration	Yes/No	Correct Times	Duration inconsistent with times noted in table	Consistent with times and duration noted in table	Incorrect Times	Duration consistent with incorrect times noted in table	Consistent with times and duration noted in table	Correct Times	Correct duration	Inconsistent with times and durations noted in table
Times	Duration	Yes/No												
Correct Times	Duration inconsistent with times noted in table	Consistent with times and duration noted in table												
Incorrect Times	Duration consistent with incorrect times noted in table	Consistent with times and duration noted in table												
Correct Times	Correct duration	Inconsistent with times and durations noted in table												
	Incorrect Response													
70	Entries provided in table but do not meet the criteria specified in Code 10													
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)													
	Nonresponse													
99	Blank													

Content Domain

Cognitive Domain

Maximum Points

Key

Acton Bus Timetables

Bus Timetable From Ourtown to Acton	
Depart: Ourtown	Arrive: Acton
8:00 am	10:15 am
9:00 am	11:15 am
10:00 am	12:15 pm
11:00 am	1:15 pm
12:00 pm	2:15 pm
1:00 pm	3:15 pm
2:00 pm	4:15 pm
3:00 pm	5:15 pm
4:00 pm	6:15 pm

Bus Timetable From Acton to Ourtown	
Depart: Acton	Arrive: Ourtown
8:30 am	10:45 am
9:30 am	11:45 am
10:30 am	12:45 pm
11:30 am	1:45 pm
12:30 pm	2:45 pm
1:30 pm	3:45 pm
2:30 pm	4:45 pm
3:30 pm	5:45 pm
4:30 pm	6:45 pm

Camford Bus Timetables

Bus Timetable From Ourtown to Camford	
Depart: Ourtown	Arrive: Camford
8:25 am	10:40 am
9:25 am	11:40 am
10:25 am	12:40 pm
11:25 am	1:40 pm
12:25 pm	2:40 pm
1:25 pm	3:40 pm
2:25 pm	4:40 pm
3:25 pm	5:40 pm
4:25 pm	6:40 pm

Bus Timetable From Camford to Ourtown	
Depart: Camford	Arrive: Ourtown
8:35 am	10:50 am
9:35 am	11:50 am
10:35 am	12:50 pm
11:35 am	1:50 pm
12:35 pm	2:50 pm
1:35 pm	3:50 pm
2:35 pm	4:50 pm
3:35 pm	5:50 pm
4:35 pm	6:50 pm

This Class Trip question continues on the next page. ➡

TIMSS2007**Mathematics****Eighth Grade**

C. Which towns meet the teacher's three scheduling conditions?

Answer: _____

M032753_3

Questions for Class Trip continue. ➡

Content Domain

Data and Chance

Cognitive Domain

Knowing

Maximum Points

1

Key

See scoring guide

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Code	Response	Item: M032753C
	Correct Response	
10	Indicates Acton and Darley	
11	Darley AND other town(s) (not Burley) consistent with answers for A and B	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007**Mathematics****Eighth Grade**

Taking into account the total distance to be traveled, the teacher's scheduling conditions, and the cost for the trip, which town can the class visit?

Answer: _____

M032756

End of Class Trip section. ●

Content Domain

Data and Chance

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide

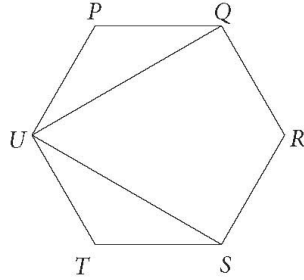
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Code	Response	Item: M032756
	Correct Response	
10	Indicates Acton	
11	Other town(s) (not Burley) consistent with previous answers	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics
Eighth Grade

$PQRSTU$ is a regular hexagon. What is the measure of the angle QUS ?

- (A) 30°
- (B) 60°
- (C) 90°
- (D) 120°

M032205

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

B

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TIMSS2007**Mathematics****Eighth Grade**

The table below shows a relation between x and y .

x	1	2	3	4	5
y	1	3	5	7	9

Which of the following equations expresses this relation?

- (A) $y = x + 4$
(B) $y = x + 1$
(C) $y = 2x - 1$
(D) $y = 3x - 2$

Content Domain

Algebra

Cognitive Domain

Applying

Maximum Points

1

Key

C

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M032381

The number of children on a trip was larger than 55, but smaller than 65.
The children could be divided into groups of 7, but not groups of 8.
How many children were on the trip?

Answer: _____

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TIMSS2007

Mathematics Eighth Grade

Content Domain

Number

Cognitive Domain

Reasoning

Maximum Points

1

Key

See scoring guide



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Code	Response	Item: M032381
	Correct Response	
10	63; 9×7 ; or 7×9	
	Incorrect Response	
70	56; 8×7 ; or 7×8	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics Eighth Grade

Which shows a correct procedure for finding $\frac{1}{5} - \frac{1}{3}$?

- (A) $\frac{1}{5} - \frac{1}{3} = \frac{1-1}{5-3}$
- (B) $\frac{1}{5} - \frac{1}{3} = \frac{1}{5-3}$
- (C) $\frac{1}{5} - \frac{1}{3} = \frac{5-3}{5 \times 3}$
- (D) $\frac{1}{5} - \frac{1}{3} = \frac{3-5}{5 \times 3}$

M032416

Content Domain

Number

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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TIMSS2007**Mathematics****Eighth Grade**

An alloy is made of gold and silver in the ratio 1 gram of gold to 4 grams of silver. What is the weight, in grams, of silver in 40 grams of this alloy?

- (A) 8
- (B) 10
- (C) 30
- (D) 32

M032160

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

D

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TIMSS2007**Mathematics**
Eighth Grade**Content Domain**

Algebra

Cognitive Domain

Applying

Maximum Points

1

Key

B

2, 5, 11, 23, ...

Starting the pattern at 2, which of these rules would give each of the terms in the number pattern above?

- (A) Add 1 to the previous term and then multiply by 2.
- (B) Multiply the previous term by 2 and then add 1.
- (C) Multiply the previous term by 3 and then subtract 1.
- (D) Subtract 1 from the previous term and then multiply by 3.

M032273

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TIMSS2007**Mathematics****Eighth Grade**

$$3(2x - 1) + 2x = 21$$

What is the value of x ?

- (A) -3
- (B) $-\frac{11}{4}$
- (C) $\frac{11}{4}$
- (D) 3

M032540

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

D

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M032698

The number of jackets that Haley has is 3 more than the number Anna has. If n is the number of jackets Haley has, how many jackets does Anna have in terms of n ?

- (A) $n - 3$
- (B) $n + 3$
- (C) $3 - n$
- (D) $3n$

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TIMSS2007

Mathematics Eighth Grade

Content Domain

Algebra

Cognitive Domain

Knowing

Maximum Points

1

Key

A



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TIMSS2007**Mathematics****Eighth Grade**

A circular pond has a radius of 10 meters. There is an average of 2 frogs per square meter in the pond. Approximately how many frogs are in the pond?

π is approximately 3.14

- (A) 120
- (B) 300
- (C) 600
- (D) 2400

M032097

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

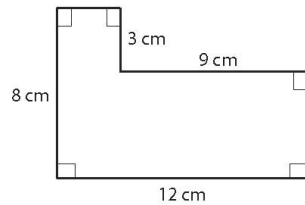
Key

C

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TIMSS2007**Mathematics****Eighth Grade**

What is the area, in square cm, of the figure shown above?

- (A) 66
- (B) 69
- (C) 81
- (D) 96

M032575

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

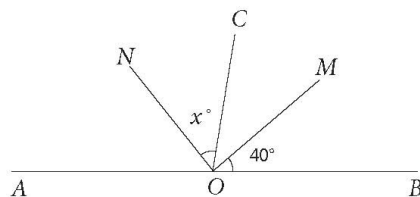
B

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TIMSS2007

Mathematics
Eighth Grade

In the figure above, points A , O , and B lie on a line. OM bisects angle BOC and ON bisects angle AOC . What is the value of x ?

Answer: _____

M032414

Content Domain

Geometry

Cognitive Domain

Applying

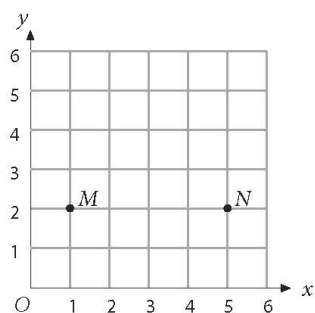
Maximum Points

1

Key

See scoring guide

Code	Response	Item: M032414
	Correct Response	
10	50 (with or without degrees)	
	Incorrect Response	
70	40 (with or without degrees)	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	



Two points M and N are shown in the figure above. John is looking for a point P such that MNP is an isosceles triangle. Which of these points could be point P ?

- (A) (3,5)
- (B) (3,2)
- (C) (1,5)
- (D) (5,1)

M032294

TIMSS2007

Mathematics Eighth Grade

Content Domain

Geometry

Cognitive Domain

Applying

Maximum Points

1

Key

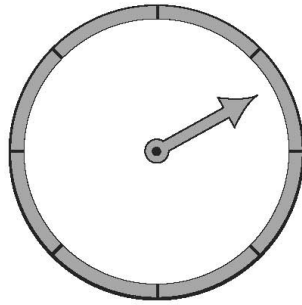
A

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Mathematics
Eighth Grade

Roland's spinner has three sectors of different colors, orange, purple, and green. Roland spins the pointer 1000 times. The chart below shows how many times the pointer stops on each section.

Color	Times Stopped
Orange	510
Purple	243
Green	247

Draw lines on the spinner above to make the three sectors the approximate size you would expect them to be. Label them orange, purple, and green.

M032688

Content Domain
Data and ChanceCognitive Domain
Applying

Maximum Points

1

Key
See scoring guide

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Code	Response	Item: M032688
	Correct Response	
10	Orange sector approximately half the circle, green and purple each approximately one-quarter, all correctly labeled	
	Incorrect Response	
70	Only one labeled sector the correct size	
71	Three sectors drawn but none the correct size	
72	Three sectors of correct size drawn but no labels	
79	Other incorrect (including crossed out/erased, stray marks, illegible, or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics

Eighth Grade

In Zedland the original price of a coat was 120 zeds. During a sale the price of the coat was 84 zeds. By what percentage was the price of the coat reduced?

- (A) 25
- (B) 30
- (C) 35
- (D) 36

M032529

Content Domain

Number

Cognitive Domain

Applying

Maximum Points

1

Key

B

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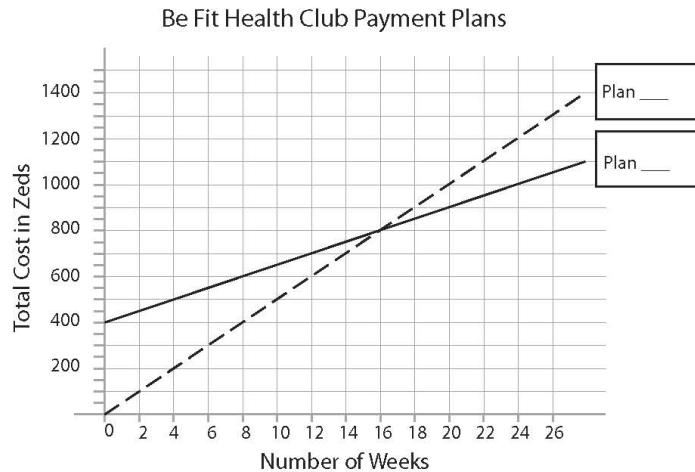
TIMSS2007

Mathematics

Eighth Grade

The Be Fit Health Club offers two different payment plans. Plan A has an initial fee of 400 zeds and a weekly fee of 25 zeds. Plan B does not have an initial fee but has a weekly fee of 50 zeds.

The figure below compares the cost for Plan A and Plan B.



- A. Label the line that represents the cost for Plan A, and label the line that represents the cost for Plan B.
- B. At which week would you have paid the same amount for Plan A and Plan B?
- C. At 24 weeks, what is the difference in total cost between the two plans?

Content Domain

Data and Chance

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

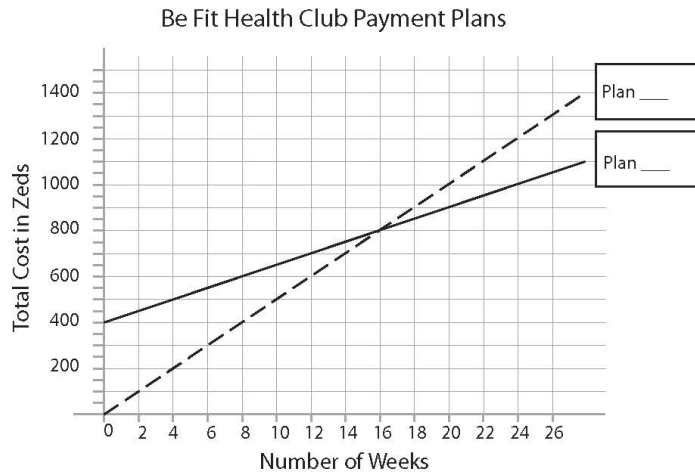
Code	Response	Item: M032637A
	Correct Response	
10	Lines correctly labeled; Plan A at solid line and Plan B at dotted line	
	Incorrect Response	
70	Lines incorrectly labeled	
79	Other incorrect (including crossed out/erased, stray marks, illegible or off task)	
	Nonresponse	
99	Blank	

TIMSS2007

Mathematics
Eighth Grade

The Be Fit Health Club offers two different payment plans. Plan A has an initial fee of 400 zeds and a weekly fee of 25 zeds. Plan B does not have an initial fee but has a weekly fee of 50 zeds.

The figure below compares the cost for Plan A and Plan B.



- A. Label the line that represents the cost for Plan A, and label the line that represents the cost for Plan B.
- B. At which week would you have paid the same amount for Plan A and Plan B?
- C. At 24 weeks, what is the difference in total cost between the two plans?

Content Domain
Data and Chance

Cognitive Domain
Knowing

Maximum Points

1

Key
See scoring guide

Code	Response	Item: M032637B
	Correct Response	
10	16	
	Incorrect Response	
79	Incorrect (including crossed out/erased, stray marks, illegible or off task).	
	Nonresponse	
99	Blank	

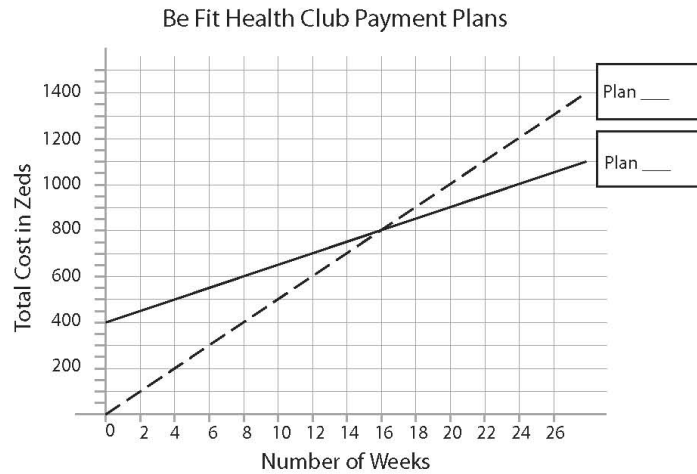
TIMSS2007

Mathematics

Eighth Grade

The Be Fit Health Club offers two different payment plans. Plan A has an initial fee of 400 zeds and a weekly fee of 25 zeds. Plan B does not have an initial fee but has a weekly fee of 50 zeds.

The figure below compares the cost for Plan A and Plan B.



- A. Label the line that represents the cost for Plan A, and label the line that represents the cost for Plan B.
- B. At which week would you have paid the same amount for Plan A and Plan B?
- C. At 24 weeks, what is the difference in total cost between the two plans?

Content Domain

Data and Chance

Cognitive Domain

Applying

Maximum Points

1

Key

See scoring guide

Note: 1200-1000 is coded as 10.

Code	Response	Item: M032637C
	Correct Response	
10	200 zeds (with or without units)	
	Incorrect Response	
70	1200 zeds , 1000 zeds, or 1200 and 1000	
79	Other incorrect (including crossed out/erased, stray marks, illegible or off task).	
	Nonresponse	
99	Blank	



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