



International Competitions and Assessments for Schools

#### DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

**STUDENT'S NAME:** 

Read the instructions on the **ANSWER SHEET** and fill in your **NAME, SCHOOL** and **OTHER INFORMATION**. Use a 2B or B pencil. Do **NOT** use a pen. Bub out any mistakes completely

You MUST record your answers on the ANSWER SHEET.

Mark only **ONE** answer for each question. Your score will be the number of correct answers. Marks are **NOT** deducted for incorrect answers.

#### **MULTIPLE-CHOICE QUESTIONS:**

Use the information provided to choose the **BEST** answer from the four possible options. On your **ANSWER SHEET** fill in the oval that matches your answer.

**FREE-RESPONSE QUESTIONS:** Write your answer in the boxes provided on the **ANSWER SHEET** and fill in the oval that matches your answer

You may use a ruler and spare paper. A **CALCULATOR** is required.

# MATHEMATICS

# Educational Assessment



# **QUESTION 5 IS FREE RESPONSE.**

Write your answer in the boxes provided on the ANSWER SHEET and fill in the ovals that match your answer. StudentBounty.com

 Katya has a set of Russian dolls. The heights of her dolls are shown. They increase by a fixed ratio.



The smallest doll fits in the next larger doll. They both fit inside the next doll. The largest doll shown fits all four of the other dolls inside it.

Katya calculates the height of the doll that can fit exactly 700 dolls inside it, including the dolls shown.

She writes the answer as:



What is the value of x?

#### Acknowledgment

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#### The following year levels should sit THIS Paper:

Australia	Year 10
Brunei	Form 5
Hong Kong	Form 4
Indonesia	Year 11
Malaysia	Form 4
New Zealand	Year 11
Pacific	Year 10
Singapore	Secondary 3
South Africa	Grade 10





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## 

HOW TO FILL OUT THIS SHEET:

USE 2B OR B PENCIL

- · Rub out all mistakes completely.
- Print your details clearly in the boxes provided.
- · Make sure you fill in only one oval in each column.

EXAMPLE 1: Debbie Bach	EXAMPLE 2: Chan Ai Beng	EXAMPLE 3: Jamal bin Abas
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Are you male	or female?
Male	Female



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Does anyone in your home usually speak a language other than English? O No ○ Yes

School name:

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## TO ANSWER THE QUESTIONS

# **MULTIPLE CHOICE**

Example:	6 + 4 =	
	(A)	2
	(B)	9

10 (C) START (D) 24

The answer is 10, so fill in the oval <sup>©</sup>, as shown.

A B D 

**1** (A) C D B **2** (A) B C D 3 A B C D **4** (A) B C D

5			
	0	0	0
	1	1	1
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	3	3	3
	4	4	4
	5	5	5
	6	6	6
	7	7	7
	8	8	8
	9	9	9

StudentBounty.com **FREE RESPONSE** Example: 6 + 6 = • The answer is 12, so WRITE your answer in the boxes. • Write only ONE digit in each box, as shown, and fill in the correct oval, as shown.

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5	5	5
6	6	6
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8	8	8
9	9	9

	$\bigcirc$	USE 2B OR B PENCIL	
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QUESTION	KEY	SOLUTION	STRAND	OF TY
1	С	The missing part in C is one third which matches the slice (one third); altogether they complete one whole.	Space and Geometry	Easy
2	А	The sum of x and y adds to $190^{\circ}$ which is more than the angle sum of a triangle (180°).	Space and Geometry	Easy
3	D	The total number of vehicles = 135 The angle at the centre for cars = $\frac{90}{135} \times 360^{\circ}$ = 240°	Chance and Data	Medium
4	С	Let D be the diameter of the big wheel (back wheel). Let d be the diameter of the small wheel (front wheel). According to the question information, D = $3/2 \times d$ . When the car travels 1 m, the big wheel makes 6 turns. Therefore, 6 × the circumference of the big wheel = 1 Circumference of the big wheel is $\pi D$ , therefore the equation can be presented as: $6 \times \pi D = 1$ (Equation 1). Let x be the number of turns the small wheel makes when the car travels 1m. Using the same logic, we can form the equation $x \times \pi d = 1$ (Equation 2) Dividing Equation 1 by Equation 2: $\frac{6D}{xd} = 1$ , make x the subject of the equation: $x = \frac{6D}{d}$ Substitute D= $3/2$ d $x = \frac{6 \times 3}{2} = 9$ .	Measurement	Medium

			Stille	lente.
5	89	Height of smallest doll is 40.5mm. Rate of increase in height of successive dolls is $\frac{128}{96}$ . Height of doll with 700 dolls inside $= 40.5 \times \left[\frac{128}{96}\right]^{700}$ $= 1.1603 \times 10^{89}$ mm Therefore, the value of <i>x</i> is 89.	Number and Arithmetic	Hard

чь.

Level of difficulty refers to the expected level of difficulty for the question.			
Easy	more than 70% of candidates will choose the correct option		
Medium	about 50–70% of candidates will choose the correct option		
Medium/Hard	about $30-50\%$ of candidates will choose the correct option		
Hard	less than 30% of candidates will choose the correct option		