Practice Questions

UNSW
THE UNIVERSITY OF NEW SOUTH WALES

eaa
EDUCATIONAL ASSESSMENT AUSTRALIA

INTERNATIONAL COMPETITIONS AND ASSESSMENTS FOR SCHOOLS

MATHEMATICS

STUDENT'S NAME:

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

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.
Rub out any mistakes completely.

You **MUST** record your answers on the **ANSWER SHEET**.

There are **3 MULTIPLE-CHOICE QUESTIONS** (1–3).
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.

There is **ONE FREE-RESPONSE QUESTION** (4).
Write your answer in the box provided on the **ANSWER SHEET**.

Your score will be the number of correct answers.
Marks are **NOT** deducted for incorrect answers.

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

PLEASE SEE BACK COVER FOR A LIST OF THE YEAR LEVELS THAT SHOULD SIT THIS PAPER

PAPER J

INTERNATIONAL COMPETITIONS AND ASSESSMENTS FOR SCHOOLS

MATHEMATICS

UNSW THE UNIVERSITY OF NEW SOUTH WALES

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HOW TO FILL OUT THIS SHEET: USE 2B OR B PENCIL

- Use 2B or B pencil only.
- 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

FAMILY NAME: BACH

GIVEN NAME: DEBBIE

EXAMPLE 2: Fahrul Asmady bin Abas

FAMILY NAME: ABAS

GIVEN NAME: FAHRUL ASMADY BIN

FAMILY NAME

GIVEN NAME

Are you Male or Female?

○ Male ○ Female

Does anyone in your home usually speak a language other than English?

○ Yes ○ No

TAP I.D. (TAP Schools only) ____ – ____ – ____

School Name: _____

Town / Suburb: _____

Today's Date: ___/___/___ **Postcode:** _____

What is your date of birth?

Day	Month	Year
01	01	00
02	02	01
03	03	02
04	04	03
05	05	04
06	06	05
07	07	06
08	08	07
09	09	08
		09

CLASS (Optional)

A	I
B	J
C	K
D	L
E	M
F	N
G	O
H	P

TO ANSWER THE QUESTIONS

MULTIPLE CHOICE
Questions 1 to 3.

Example: 4 + 6 = ?

(A) 2
(B) 9
(C) 10
(D) 24

The answer is 10, so fill in the oval Ⓒ as shown.

Ⓐ Ⓑ ● Ⓓ

FREE RESPONSE
Question 4.

Example: 6 + 6 = ?

- The answer is 12, so WRITE your answer in the boxes.
- Write only ONE digit in each box as shown.

	1	2

START

1 Ⓐ Ⓑ Ⓒ Ⓓ

2 Ⓐ Ⓑ Ⓒ Ⓓ

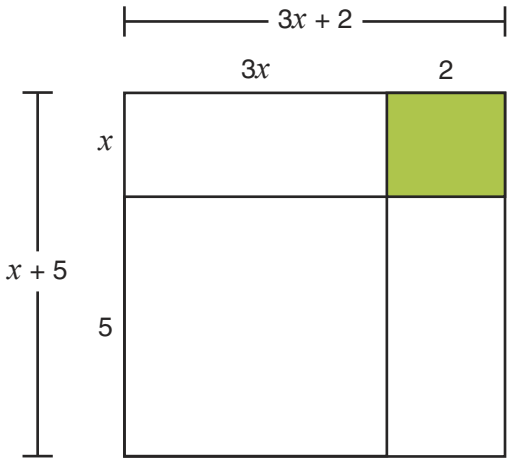
3 Ⓐ Ⓑ Ⓒ Ⓓ

4 ☐☐☐

INTERNATIONAL COMPETITIONS AND ASSESSMENTS FOR SCHOOLS
MATHEMATICS

PAPER J

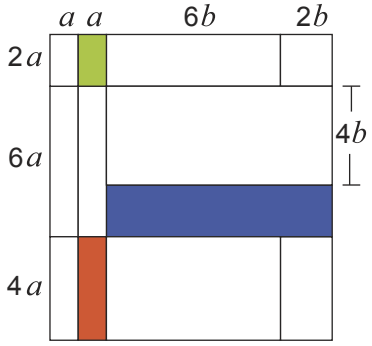
1. The diagram below represents the products of $(x + 5)$ and $(3x + 2)$.



What product is represented by the shaded rectangle?

(A) $2x$
(B) $6x$
(C) x^2
(D) $3x^2$

2. This picture is based on the style of the Dutch artist Piet Mondrian (1872–1944).



NOT TO SCALE

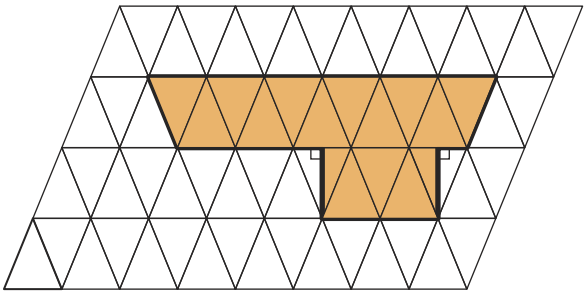
Which expression gives the total area of the three coloured rectangles in the picture?

(A) $6a^2 + 48ab - 32b^2$
(B) $20a^2 + 24b^2$
(C) $4a^2 + 36ab - 24b^2$
(D) $6a^2 + 16b^2$

3. The area of one of these isosceles triangles is 60 square units.

The length of the base of the triangle is 10 units.

The grid below is made up of triangles exactly the same size as the triangle above.



What is the **perimeter** of the shaded shape?

(A) 105
(B) 150
(C) 160
(D) 162

4. Harry has written the expression shown.

$$\frac{9a^2}{b} + \frac{243}{ab} + \frac{9b^2}{a}$$

What is the least possible value of Harry's expression if a and b are positive integers?

(Write only the number on your answer sheet.)

END OF PAPER

THE FOLLOWING YEAR LEVELS SHOULD SIT FOR THIS PAPER:

AUSTRALIA: Year 12
BRUNEI: Pre-University 2
INDONESIA: Year 12
MALAYSIA: Upper 6
NEW ZEALAND: Year 13
PACIFIC: Year 12
SINGAPORE: Junior College 1
SOUTH AFRICA: Grade 12

Question solutions–Paper J

Question 1

Answer key: A
Category: Algebra

Options	*Reasoning for options*
A $2x$	Correct.
B $6x$	Incorrect. Combination of top two numbers.
C x^2	Incorrect. x times x.
D $3x^2$	Incorrect rectangle chosen.

Difficulty level: Easy. Approx 80 – 100% expected correct.

Question 2

Answer key: A
Category: Algebra

Options	*Reasoning for options*	
A	Correct.	
	Area of green rectangle:	$2a \times a = 2a^2$
	Area of red rectangle:	$a \times 4a = 4a^2$
	Area of blue rectangle:	$8b \times (6a - 4b) = 48ab - 32b^2$
	Total area:	$2a^2 + 4a^2 + 48ab - 32b^2 = 6a^2 + 48ab - 32b^2$
B	Incorrect guess.	
C	Incorrect guess.	
D	Incorrect guess.	

Difficulty level: Medium. Approx 31 – 79% expected correct.

Question 3

Answer key: C
Category: Space

Options	*Reasoning for options*
A 105	Incorrect. Horizontal total, not including one half portion.
B 150	Incorrect. Does not count two half portions of horizontal.
C 160	Correct. (50 + 60 +24 +26)
D 162	Incorrect addition. (50 + 60 + 26 + 26)

Difficulty level: Hard. Less than 31% expected correct.

Question 4

Answer key: 81
Category: Algebra

Reasoning
Uses $a = b = 3$ to give $3^3 + 3^3 + 3^3$

Difficulty level: Hard. Less than 31% expected correct.