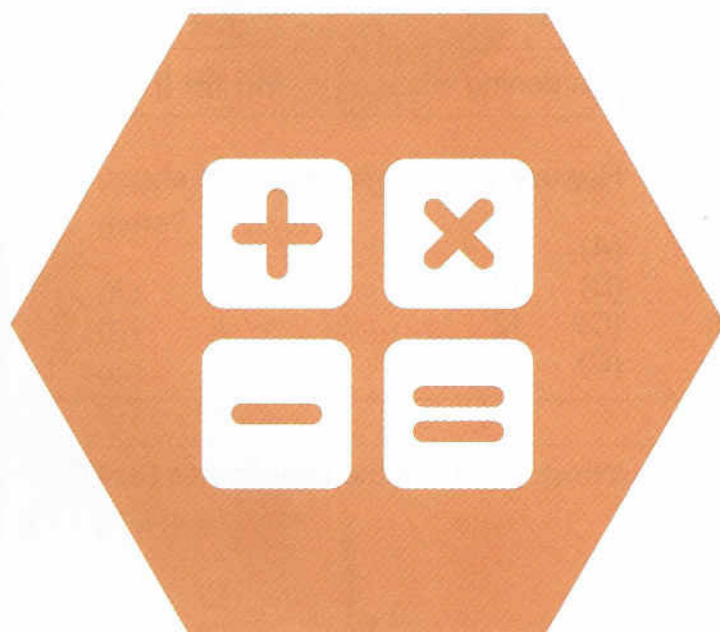# PAPER
E

2015
ICAS

International Competitions
and Assessments for Schools

MATHEMATICS

Educational Assessment Australia
eaa.unsw.edu.au

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

40 QUESTIONS

TIME ALLOWED: 1 HOUR

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.
Rub 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.

There are **35 MULTIPLE-CHOICE QUESTIONS** (1–35).
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 are **5 FREE-RESPONSE QUESTIONS** (36–40).
Write your answer in the boxes provided on the **ANSWER SHEET**
and fill in the ovals that match your answer.

You may use a ruler and spare paper.
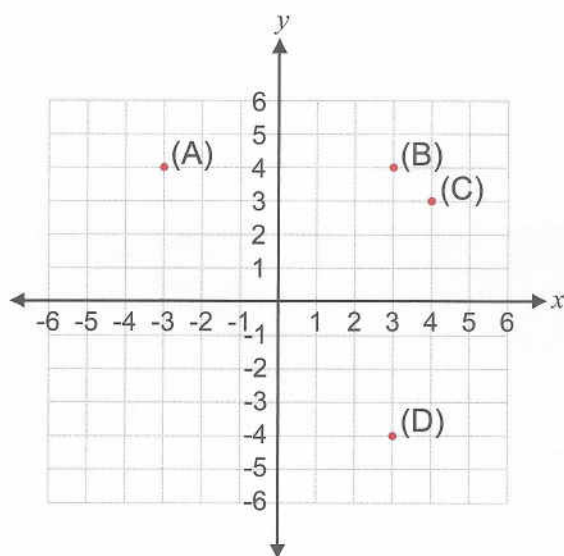You are **NOT** allowed to use a calculator.

1. All 29 students in Mr Liu's class chose one lunchtime club. The results are shown in this table.

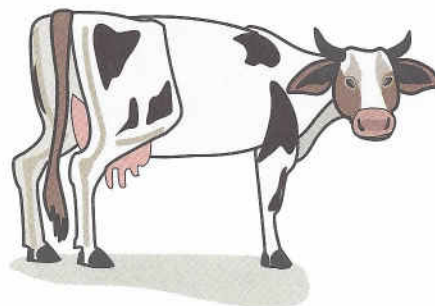| Type of club	Tally
music	卌 ‖
chess	?
gardening	卌 卌 ‖

How many students chose the chess club?

(A) 22
(B) 19
(C) 12
(D) 10

2. Which point has the coordinates (3, 4)?

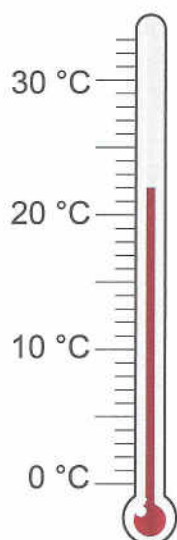3. What is the approximate mass of an adult dairy cow, in kilograms?

(A) 5
(B) 50
(C) 500
(D) 5000

4. 480, 240, 120, 60, 30, ...

How can you find the next number in this pattern?

(A) halve the previous number
(B) double the previous number
(C) subtract 30 from the previous number
(D) subtract 240 from the previous number

5. What temperature reading is shown on this thermometer?

    30 °C

    20 °C

    10 °C

    0 °C

(A) 24 °C
(B) 23 °C
(C) 22 °C
(D) 21 °C

6. Saira had $500.

She spent 25% of this money on clothes and saved the rest.

How much money did Saira save?

(A) $375
(B) $350
(C) $150
(D) $125

7. Raj buys a bottle of 30 vitamin tablets. Each tablet contains 50 mg of the vitamin.

How many grams of the vitamin are in the bottle?

(A) 1500 g
(B) 150 g
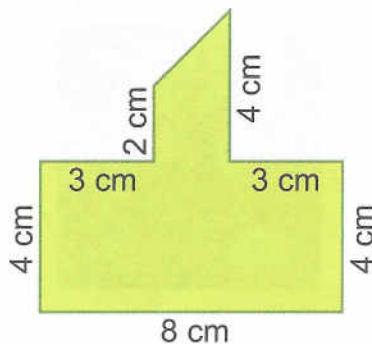(C) 15 g
(D) 1.5 g

8. The picture shows a 12-sided coin.

How many pairs of parallel sides are there?

(A) 3
(B) 4
(C) 6
(D) 12

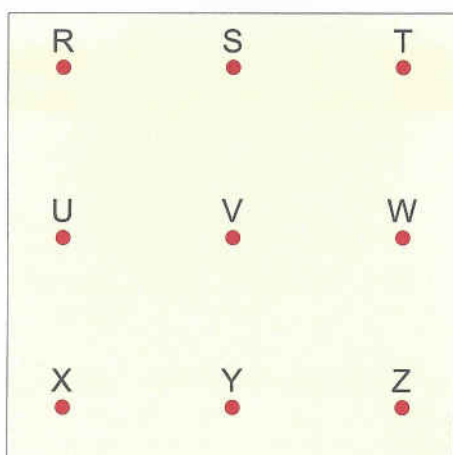9. $3^2 \times 3^2 = \boxed{?}$

(A) 12
(B) 18
(C) 36
(D) 81

10. What is the area of this figure?

2 cm

4 cm

3 cm   3 cm

4 cm

4 cm

8 cm

(A) 40 cm²
(B) 38 cm²
(C) 32 cm²
(D) 25 cm²

3

11. The points on the square dot paper below are labelled from R to Z.

R   S   T

U   V   W

X   Y   Z
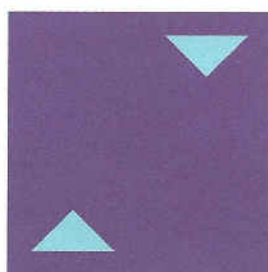
Point X is north of Point T.

Which point is south-east of Point V?

(A) Point R
(B) Point S
(C) Point W
(D) Point Z

12. Equilateral triangles have rotational symmetry of order 3.

What is the order of rotational symmetry of this shape?

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

13. A company owns a fleet of 100 cars. Each car is either black or white.

There are 35 black cars.
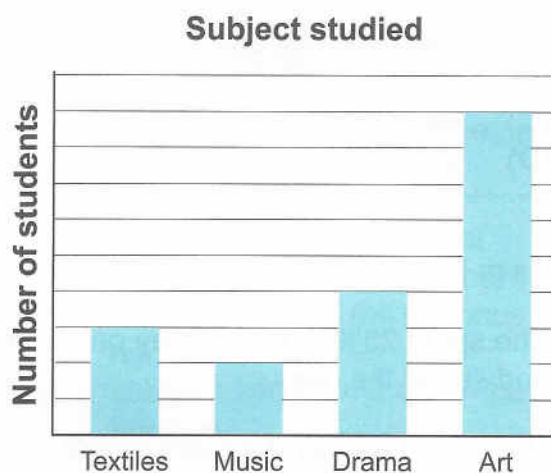
A car is picked at random from the fleet.

What is the probability that it is white?

(A) 0.35   (B) 0.65

(C) $\dfrac{1}{35}$ (D) $\dfrac{1}{65}$

14. This column graph represents the number of students who chose to study one of four subjects.

Subject studied

There are 270 students altogether.

How many students are studying Drama?

(A) 60
(B) 80
(C) 100
(D) 120

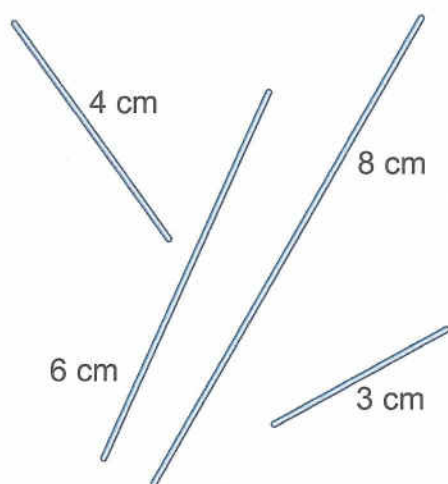15. Bill took part in a quiz.

There were three types of questions.

Question type	Points
knowledge	2
skill	5
application	7

Bill scored 39 points.

What is the maximum number of questions that Bill could have answered correctly?

(A)　14
(B)　17
(C)　18
(D)　19

16. Lin has four rods as shown.

4 cm

8 cm

6 cm

3 cm

Lin wants to form a triangle using three rods. The rods should not overlap.

Which three rods CANNOT be used to form a triangle?

(A)　3 cm, 4 cm, 6 cm
(B)　3 cm, 4 cm, 8 cm
(C)　3 cm, 6 cm, 8 cm
(D)　4 cm, 6 cm, 8 cm

17. Mrs Li works in a shop. Each week she earns a normal rate of pay of $10 per hour for the first 35 hours. For the next 5 hours she earns an extra $5 per hour. For any hours worked after this she earns double her normal rate of pay.

Last week Mrs Li worked 45 hours.

How much money did Mrs Li earn last week?

(A)　$450
(B)　$475
(C)　$525
(D)　$550

18. Krish used cubes to build a solid matching these three views.

top view

side view

front view
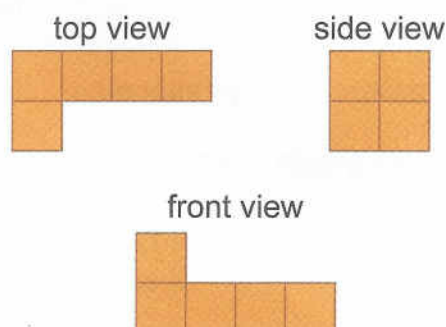
Which of these could be Krish's solid?

(A)

(B)

(C)

(D)

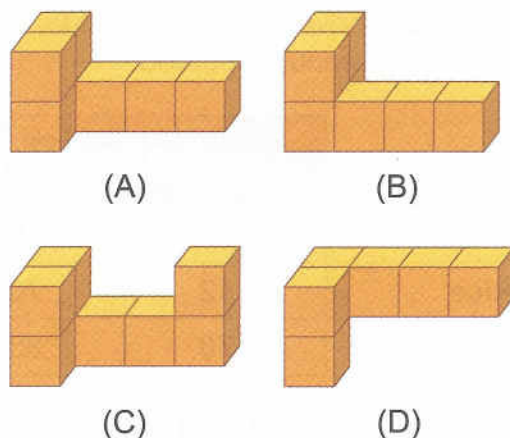**19.** Sarah started with a number.

She multiplied it by 3 and then added 6. Her answer was 30.

Yumi started with the same number as Sarah.

She halved it and then added 20.

What was Yumi's answer?

(A)   35
(B)   28
(C)   24
(D)   23

20. A group of 60 students went to the beach.

Of the 34 students who brought a hat, 25 were boys.

There were 36 boys altogether.

How many girls did not bring a hat?

(A)   9
(B)   15
(C)   24
(D)   26

21. This table shows the energy value, in kJ, of different amounts of food.

	Mass (g)	Energy value(kJ)
Lamb	128	1500
Rice	42	700
Vegetables	70	350

For dinner Dewi ate 64 g of lamb, 84 g of rice and 280 g of vegetables.

What was the energy value of her dinner?

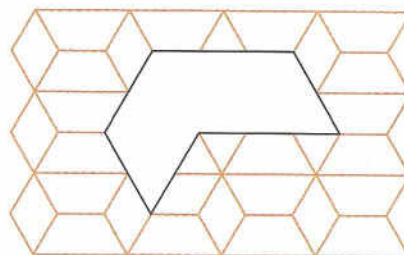(A)   3550 kJ
(B)   2850 kJ
(C)   2550 kJ
(D)   1800 kJ

22. Mr Li wrote this number sentence.

$14 - 12 \div 2 + \boxed{?} \div 5 = 11$

What must the value of $\boxed{?}$ be?

(A)   54
(B)   50
(C)   47
(D)   15

23. The section, outlined in black, represents a missing piece in this pattern.

Which of these is the missing piece?

(A)   (B)

(C)   (D)
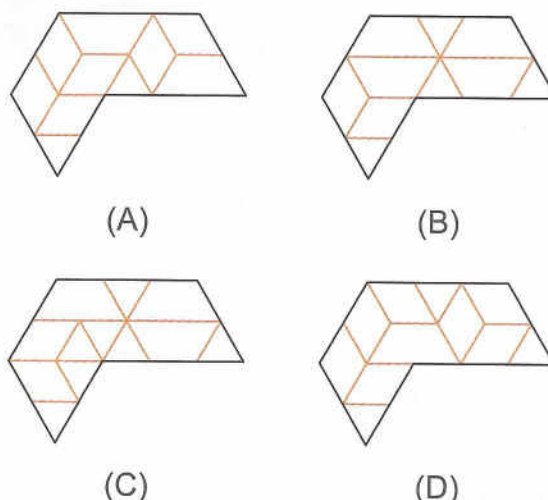
24. Danny had a rope 3.6 m long. He cut a piece 1.7 m long from the rope. He cut the remaining rope into 5 equal pieces. He laid 3 of these equal pieces in the shape of a triangle.

What is the perimeter of the triangle?

(A)   0.13 m
(B)   0.38 m
(C)   1.02 m
(D)   1.14 m

25. Manu has some cubes in three different colours.

Cubes of the same colour have the same mass.
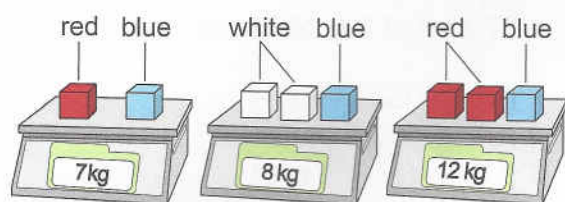
She weighs the cubes.

red blue   white blue   red blue

7 kg   8 kg   12 kg

What is the mass of one white cube, in kilograms?

(A)   1.5
(B)   2
(C)   2.5
(D)   3

26. Jai had 69 picture cards including 15 pairs and 9 triples. A pair is two of the same kind of card. A triple is three of the same kind of card.

He kept one of each kind of card and gave the rest away.

How many cards did he keep?

(A)   36
(B)   45
(C)   51
(D)   57

27. The yellow shape is to be transformed so it completely covers the other shape.
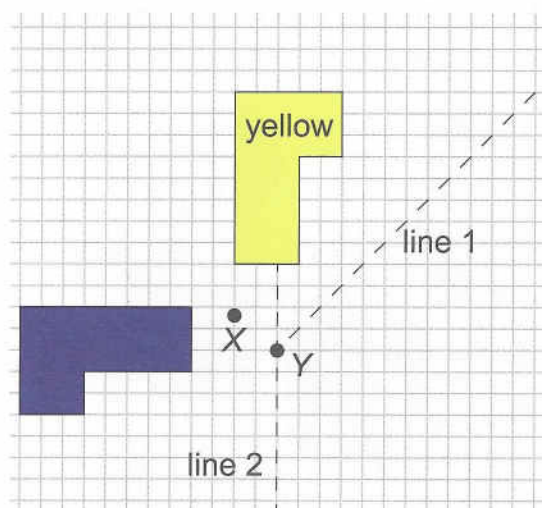
Which transformation will achieve this?

(A)   reflect in line 1 and rotate 180° about Y

(B)   reflect in line 1 and rotate 180° about X

(C)   reflect in line 2 and rotate 180° about Y

(D)   reflect in line 2 and rotate 180° about X

28. Edward has 240 mL of milk with his cereal five times a week.

He also drinks 300 mL of orange juice twice a week.

Milk 1L

Orange Juice 300 mL

Contains sugar 5 g/100 mL

Contains sugar 5 g/100 mL

How many grams of sugar are in the milk and orange juice that Edward consumes in a week?

(A)   10
(B)   35
(C)   90
(D)   540

29. A drink bottle is $\frac{3}{8}$ full.

It contains 240 millilitres of water.

How much water does the bottle contain when it is half-full?

(A)   90 millilitres
(B)   120 millilitres
(C)   320 millilitres
(D)   640 millilitres

30. Al and Cam are two cleaners.

Al cleans 50 m² of an office in 20 minutes.

Cam cleans 60 m² of the same office in 30 minutes.

How long will it take Al and Cam to clean 270 m² of this office together?

(A)   50 minutes
(B)   60 minutes
(C)   120 minutes
(D)   150 minutes

31. On Saturday, Flavia is travelling by train to Brooklyn and then by ferry to Dangar Island.

She is having lunch on Dangar Island at midday.

On the return trip, Flavia must catch the 4:30 pm train home from Brooklyn.

Train Timetable	
Arrive Brooklyn	Depart Brooklyn
10:30 am	2:45 pm
11:25 am	3:50 pm
12:25 am	4:30 pm

Ferry Timetable		
Depart Brooklyn	Dangar Island	Arrive Brooklyn
10:25 am	10:55 am	11:10 am
11:40 am	11:55 am	12:10 pm
3:20 pm	3:35 pm	4:05 pm
4:10 pm	4:25 pm	4:40 pm

What is the least amount of time Flavia must spend in Brooklyn in total?

(A)   15 minutes
(B)   20 minutes
(C)   25 minutes
(D)   40 minutes

32. Matt travelled from Bohemia to Aragon.
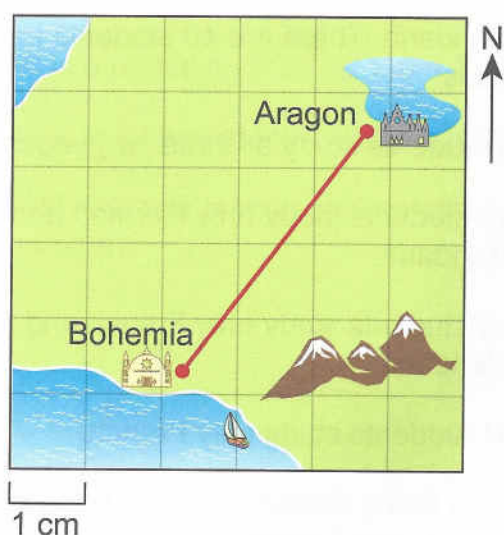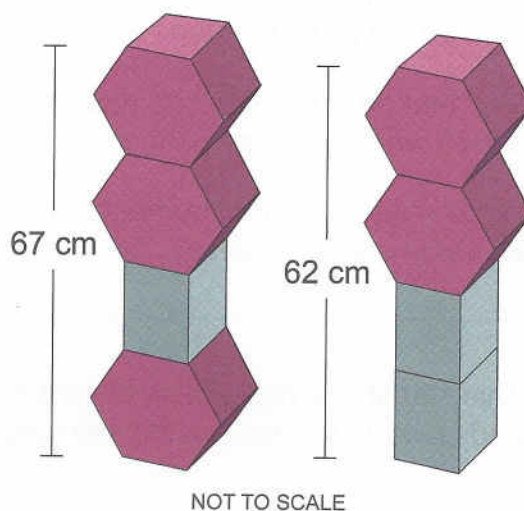

On this map, 1 cm represents 300 000 cm of actual distance.

Approximately how far did Matt travel?

(A)   7.5 km
(B)   12 km
(C)   75 km
(D)   120 km

34. Yara had blocks in the shape of rectangular prisms and regular hexagonal prisms.

She stacked her blocks as shown.

NOT TO SCALE

What is the height of one rectangular prism?

(A)   18 cm
(B)   16.75 cm
(C)   15.5 cm
(D)   13 cm

33. In the Jones family there are boys and girls.

Each boy in the Jones family has as many brothers as sisters.

Each girl in the Jones family has twice as many brothers as sisters.

How many children are there in the Jones family?

(A)   3
(B)   6
(C)   7
(D)   9

35. Lin's journey from City X to City Y took 23 hours and 15 minutes.

City Y is 14 hours behind City X.

She left City X at 7:55 am on 12 June, City X time.

What was the date and time in City Y when Lin arrived?

(A)   12 June at 5:10 pm
(B)   12 June at 9:10 pm
(C)   13 June at 7:10 am
(D)   13 June at 5:10 pm

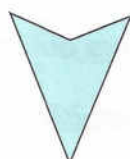36. Hats may be ordered from a supplier for $7.50 each or $60 for ten.

    Mr Chan orders some hats and pays $2685 which includes $300 postage.

    What is the maximum number of hats Mr Chan should receive?

37. This star shape has 8 lines of symmetry and is made by overlapping two squares.
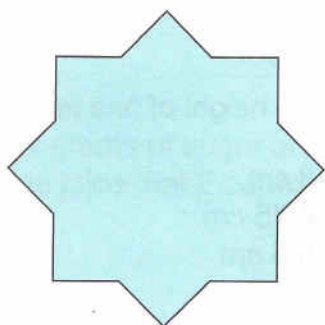
    The shape can be split into 8 identical quadrilaterals that look like this:

    What is the size of the largest angle in the quadrilateral, in degrees?

38. At Prime High School there are three language classes; French, German and Mandarin. There are 40 students in each class.

    5 students study all three languages.

    12 students study only German and Mandarin.

    15 students study only French and Mandarin.

    11 students study only French.

    How many students study languages at Prime High School?

39. A small square is cut out of a larger square.
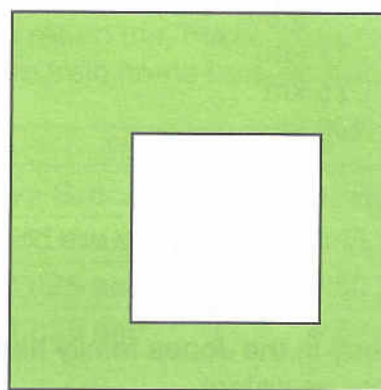
    NOT TO SCALE

    The side lengths of both squares, in centimetres, are whole numbers less than 25. The remaining area of the larger square is 57 cm².

    What is the perimeter of the small square, in centimetres?

40. A pronic number is the product of two consecutive positive integers.

110 is a pronic number as 110 = 11×10.

The sum of two pronic numbers is 240.

What is the difference between these two numbers?

HOW TO FILL OUT THIS SHEET:

USE 2B OR B PENCIL

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

EXAMPLE 1: Debbie Bach

FIRST NAME | LAST NAME
D E B B I E | B A C H

EXAMPLE 2: Chan Ai Beng

FIRST NAME | LAST NAME
C H A N | A I   B E N G

EXAMPLE 3: Jamal bin Abas

FIRST NAME | LAST NAME
J A M A L   B I N | A B A S

FIRST NAME to appear on certificate

LAST NAME to appear on certificate

Are you male or female?
○ Male   ○ Female

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

School name: _____

Town / suburb: _____

Today's date: _____ / _____ / _____   Postcode: _____

DATE OF BIRTH

Day		Month		Year	
⓪	⓪	⓪	⓪	⓪	⓪
①	①	①	①	①	①
②	②		②	②	②
③	③		③	③	③
	④		④	④	④
	⑤		⑤	⑤	⑤
	⑥		⑥	⑥	⑥
	⑦		⑦	⑦	⑦
	⑧		⑧	⑧	⑧
	⑨		⑨	⑨	⑨

CLASS (optional)

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

The following year levels should sit THIS Paper:

Australia	Year 7
Brunei	Form 1
Indonesia	Year 8
Malaysia	Form 1
New Zealand	Year 8
Pacific Region	Year 8
Singapore	Primary 6
South Africa	Grade 7

PAPER E
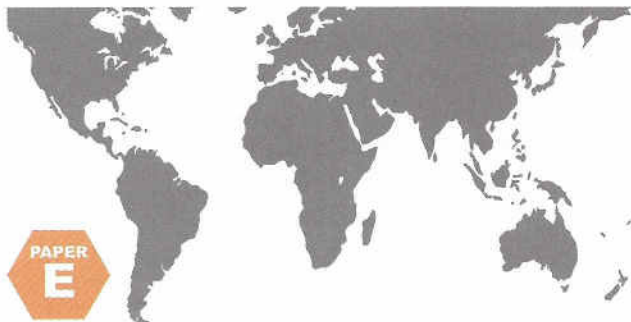
UNSW Global
AUSTRALIA

Educational Assessment Australia
eaa.unsw.edu.au
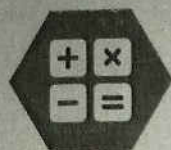
M | 2015 Mathematics Answer Keys

ICAS
International Competitions
and Assessments for Schools

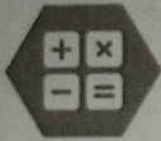| Question Number	Paper A	Paper B	Paper C	Paper D	Paper E	Paper F	Papers G & H	Papers I & J
1	A	C	B	C	D	D	D	D
2	B	C	C	B	B	B	D	D
3	B	A	C	D	C	D	A	B
4	C	A	B	C	A	D	B	B
5	B	B	A	B	C	B	D	C
6	C	D	D	C	A	A	C	A
7	D	A	A	D	D	B	A	A
8	A	A	A	B	C	C	D	D
9	D	C	C	A	D	A	C	A
10	A	B	D	C	B	A	B	C
11	B	B	C	D	B	C	D	A
12	D	A	D	B	C	A	A	D
13	A	C	A	B	B	C	B	B
14	C	C	D	D	A	B	C	C
15	A	C	B	A	C	C	B	A
16	D	A	C	D	B	A	B	C
17	A	D	A	C	C	D	A	D
18	C	C	D	A	A	D	B	A
19	A	D	C	C	C	B	C	B
20	D	B	D	C	B	D	C	B
21	B	A	B	A	A	C	B	D
22	B	D	A	D	D	A	C	C
23	A	D	B	B	B	B	A	D
24	C	C	B	D	D	B	A	B
25	A	D	D	C	D	D	D	B
26	D	A	B	B	A	B	D	A
27	C	B	C	B	A	B	C	B
28	B	A	C	D	C	C	B	C
29	B	C	B	B	C	A	A	B
30	C	B	A	D	B	C	D	C

(Please turn ov

M | 2015 Mathematics Answer Keys

ICAS
International Competitions
and Assessments for Schools

Question Number	Paper A	Paper B	Paper C	Paper D	Paper E	Paper F	Papers G & H	Papers I & J
31	B	A	B	A	D	C	D	B
32	D	D	D	A	B	A	B	C
33	B	B	A	C	C	D	D	A
34	A	D	C	D	D	C	C	D
35	C	B	B	B	A	B	B	C
36	B	C	D	6|06|006|0 6	396	32|032	189	33|033
37	C	B	B	28|028	225	72|072	33|033	298
38	D	D	A	12|012	74|074	180	75|075	585
39	D	A	C	90|090	32|032	146	127	128
40	A	B	B	640	180	189	26|026	242

Contact Details

Telephone: +61 2 8344 1016
Email: info@eaa.unsw.edu.au
Website: www.eaa.unsw.edu.au