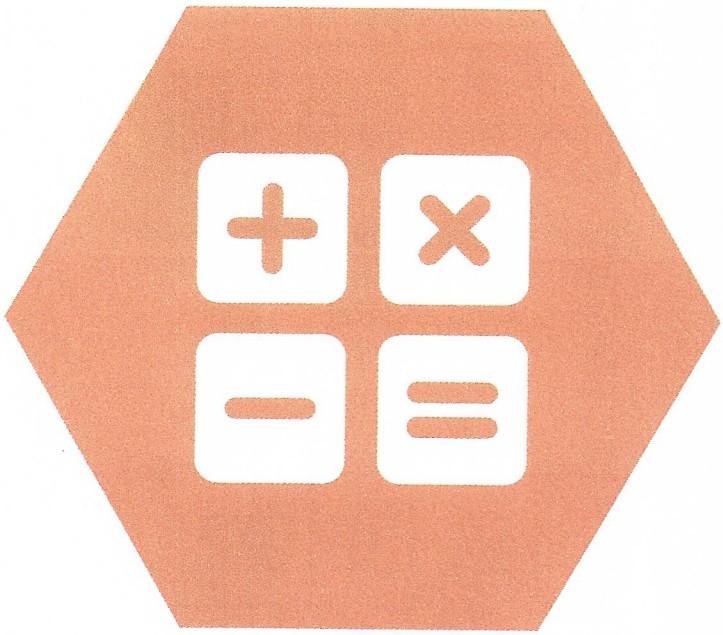
UNSW Global
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

PAPER E



2013 ICAS

International Competitions and Assessments for Schools

MATHEMATICS

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.

Educational Assessment Australia
eaa.unsw.edu.au

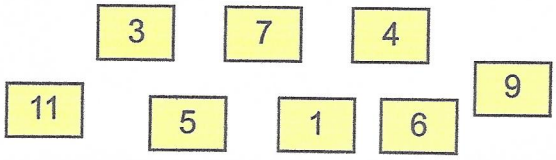
1. The table lists the birth years of four people.

Name	Birth year
Anna	2000
Mia	2003
Raj	1997
Sue	2008

Which people were born in even-numbered years?

(A) Mia and Raj
(B) Mia and Sue
(C) Anna and Raj
(D) Anna and Sue

2. Edward has these cards in a bag.



Edward randomly takes a card from the bag without looking.

What is his chance of taking a card with a number less than 5?

(A) 4 in 8
(B) 3 in 8
(C) 1 in 8
(D) 1 in 3

3. What is 70% as a fraction?

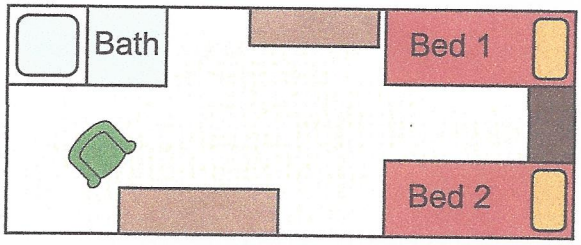
(A) $\frac{7}{100}$ (B) $\frac{7}{10}$
(C) $\frac{100}{7}$ (D) $\frac{10}{7}$

4. Sue bought this tea container.

What shape is Sue's container?

(A) circle
(B) cone
(C) sphere
(D) cylinder

5. Here is the floor plan of a cabin on a cruise ship.



What fraction of the total cabin area do the two beds occupy?

(A) $\frac{2}{3}$
(B) $\frac{1}{3}$
(C) $\frac{2}{9}$
(D) $\frac{1}{9}$

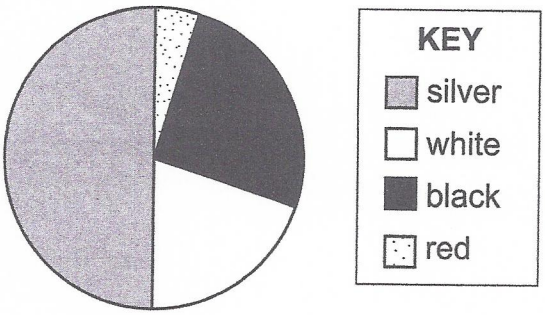
6. Mia has a cone, a triangular prism and a square pyramid.

What is the total number of triangular faces on these three solids?

(A) 6
(B) 7
(C) 8
(D) 9

7. Sue counted the number of cars that passed her house one afternoon.

She then grouped them by colour and presented the data in a graph.

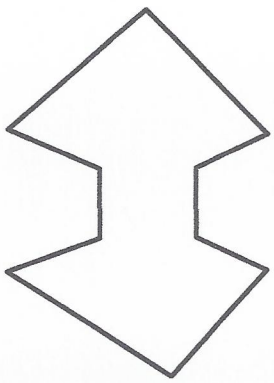


Sue counted 20 black cars.

How many cars did Sue count altogether?

(A) 20
(B) 40
(C) 60
(D) 80

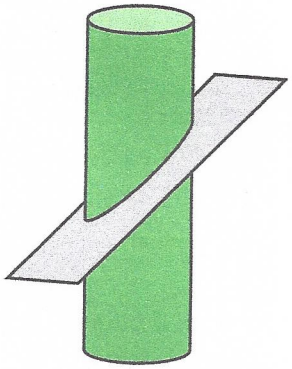
8. Adam drew this shape.



This shape is an example of a

(A) parallelogram.
(B) tetrahedron.
(C) nonagon.
(D) polygon.

9. Sue cut across a cylinder of modelling clay as shown in the diagram.

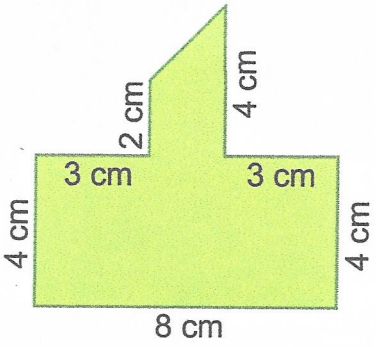


Which option best shows the shape of the face made by this cut?


(A) (B)

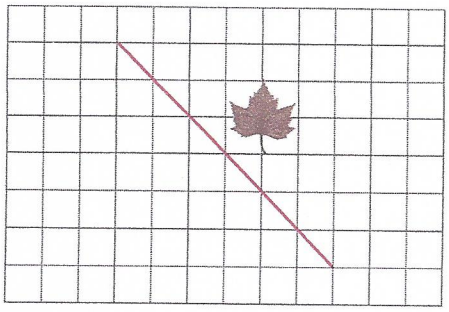

(C) (D)

10. What is the area of this figure?



(A) 40 cm^2
(B) 38 cm^2
(C) 32 cm^2
(D) 25 cm^2

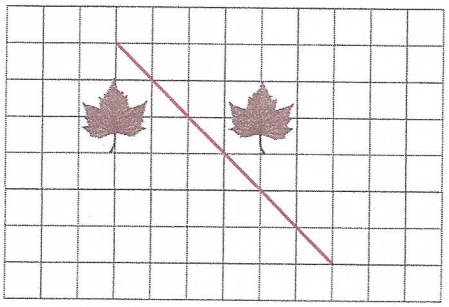
11. Danny drew a leaf on grid paper.



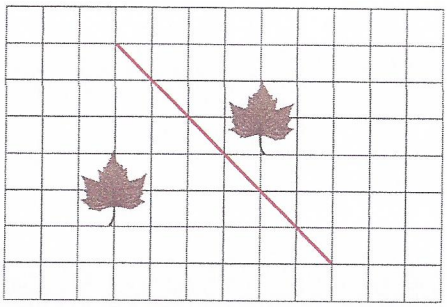
He reflected it in the line. He then translated it two squares to the left.

Which of these shows the leaf before and after the two transformations?

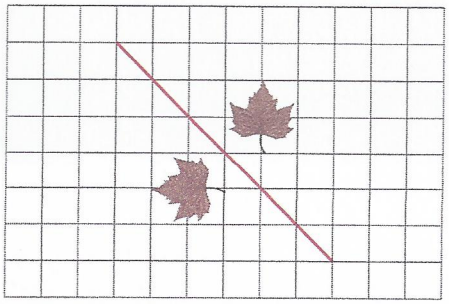
(A)



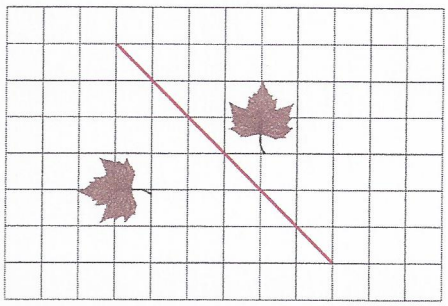
(B)



(C)



(D)



12. Which of these is the best estimate for $\sqrt{7}$?

(A) 2.6
(B) 3.5
(C) 7
(D) 49

13. Raj had \$50.00. He bought a book that cost \$17.50.

How much money should Raj have left?

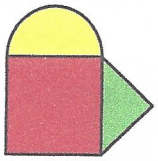
(A) \$43.50
(B) \$42.50
(C) \$33.50
(D) \$32.50

14. What is the missing number in this pattern?

9, 36, 81, 144, ?

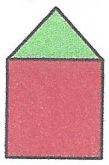
(A) 225
(B) 207
(C) 171
(D) 169

15. Figure A



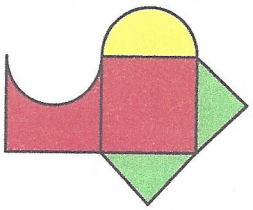
Area = 50 cm²

Figure B



Area = 42 cm²

Figure C



Area = ?

What is the area of Figure C?

(A) 84 cm²
(B) 92 cm²
(C) 100 cm²
(D) 117 cm²

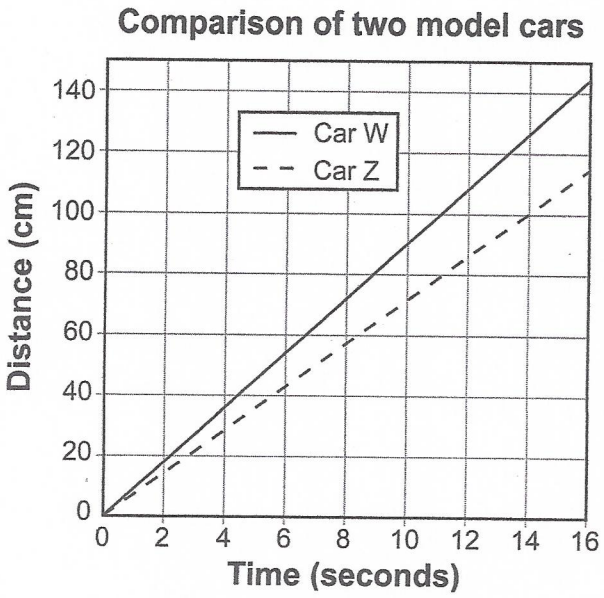
16. Anish had these four cards.

He picked two cards at random and then added the numbers on these two cards to get a total.

The total has the greatest chance of being a multiple of:

(A) 2 (B) 3
(C) 4 (D) 7

17. Manling is testing two model cars. She drew a graph to show how far they travelled in a given time.



What is the approximate distance between the two cars after 14 seconds?

(A) 12 cm
(B) 25 cm
(C) 30 cm
(D) 42 cm

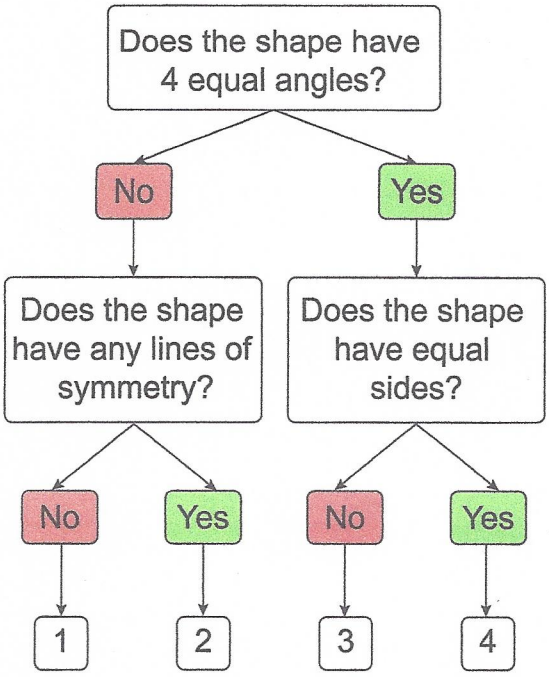
18. Danny had a jug with a capacity of 5 cups.

The jug was $\frac{3}{5}$ full of juice. Danny added $\frac{1}{2}$ a cup of juice to the jug.

How full was the jug after Danny added the juice?

(A) $\frac{7}{10}$ full (B) $\frac{11}{10}$ full
(C) $\frac{3}{4}$ full (D) $\frac{4}{7}$ full

19. Here is a chart about 4-sided shapes.



Anna used the chart to sort this shape.

Where should Anna put the shape?

(A) in 1 (B) in 2

(C) in 3 (D) in 4

20. Raj has four pieces of copper wire. The lengths of the pieces are 3 m, 45 cm, 86 cm and 8 m.

Raj sells the four pieces for a total price of $36.

What calculation can Raj use to find the price per metre?

(A) (3 + 0.45 + 0.86 + 8) ÷ 36
(B) (3 + 4.5 + 8.6 + 8) ÷ 36
(C) 36 ÷ (3 + 0.45 + 0.86 + 8)
(D) 36 ÷ (3 + 4.5 + 8.6 + 8)

21. The Blue team played three games of basketball on Saturday and three games on Sunday. Overall the team scored an average of 16 points in their games.

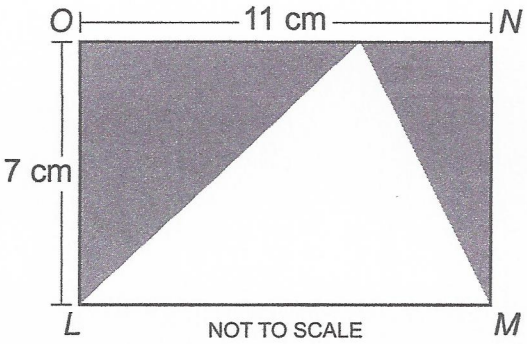
The table shows their scores in five of the games.

	Game 1	Game 2	Game 3
Saturday	24	20	16
Sunday	17	13	?

How many points did the Blue team score in Game 3 on Sunday?

(A) 6
(B) 9
(C) 16
(D) 18

22. *LMNO* is a rectangle.



What is the area of the shaded part, in cm²?

(A) 77 (B) $51\frac{2}{3}$

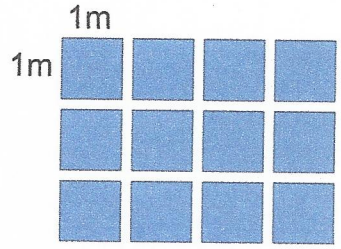
(C) $38\frac{1}{2}$ (D) 36

23. This box has a volume of 1 cubic metre.

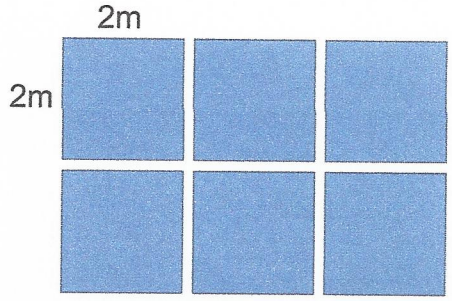
Raj used six squares to make this box. Each square has an area of one square metre.

Which set of shapes should Raj use to make a box that has a volume of 2 cubic metres, without having any shapes left over?

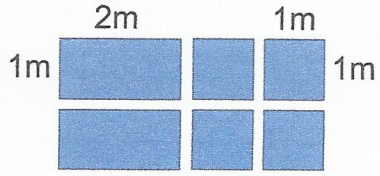
(A)



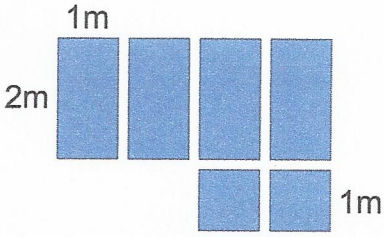
(B)



(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. A group of volunteers planted a total of 30 trees in a local park. Three different types of trees were planted: eucalypt, wattle and pine trees.

Of the trees planted, 60% were eucalypt trees and 10% were wattle trees.

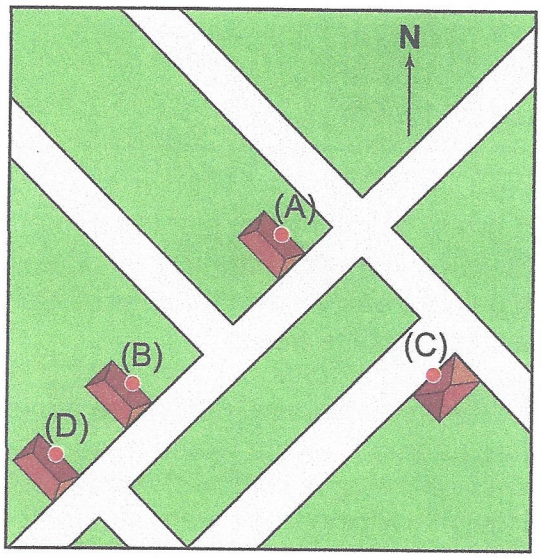
How many pine trees were planted?

(A) 9
(B) 10
(C) 21
(D) 30

26. Below is a map of Smithvale.

The library is located to the north-east of the school and to the south-west of the fire station. The mall is located to the south-east of the fire station.

Which building is the school?



27. Anna is driving at a constant speed of 50 km/h.

How many seconds will it take Anna to drive 100 m?

(A) $\frac{100 \times 3600}{50 \times 1000}$ (B) $\frac{50 \times 1000}{3600 \times 100}$

(C) $\frac{100 \times 1000}{50 \times 3600}$ (D) $\frac{1000 \times 3600}{50 \times 100}$

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.

Contains sugar 5g/100 mL

Contains sugar 5g/100 mL

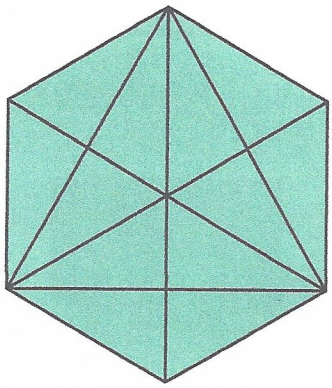
How many grams of sugar are in the milk and orange juice that Edward consumes in a week?

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

29. What is the first prime number greater than 2000?

(A) 2001
(B) 2003
(C) 2007
(D) 2009

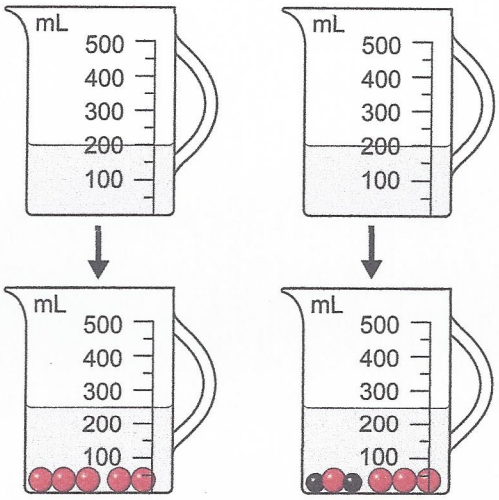
30. How many triangles of any size are there in this diagram?



(A) 43
(B) 37
(C) 17
(D) 13

31. Anna has two jugs. Each jug contains 200 mL of water.

Anna dropped 5 red balls in one jug. She also dropped 4 red and 2 black balls in the other jug.



What is the volume of one black ball?

(A) 5 cm^3
(B) 8 cm^3
(C) 10 cm^3
(D) 25 cm^3

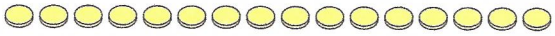
32. Our numeral system is called base 10. It has ten digits, 0 to 9.

Another numeral system is the Binary system (also called base 2). It has two digits only, 0 and 1.

The table shows the first four counting numbers in the Binary system.

Binary number	Counters
1	●
10	●●
11	●●●
100	●●●●

Anna has these counters.



What is the number of Anna's counters written in the Binary system?

(A) 16 (B) 111
(C) 400 (D) 10000

33. $4! = 4 \times 3 \times 2 \times 1$

$5! = 5 \times 4 \times 3 \times 2 \times 1$

Jess wrote the expression $20! - 19!$ on the board.

Which of the following has the same value as this expression?

(A) 1!
(B) 20
(C) $19 \times 19!$
(D) $20 \times 19!$

34. 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. Edward has an alarm clock that is set 4 minutes ahead of the actual time. The alarm is set to ring when it reaches 6:14 am. It then rings every 8 minutes after that.

Raj has an alarm clock that is set 3 minutes behind the actual time. The alarm is set to ring when it reaches 6:10 am. It then rings every 7 minutes after that.

What is the actual time when both Edward's and Raj's clocks ring together for the first time?

(A) 6:34 am
(B) 6:38 am
(C) 6:42 am
(D) 7:06 am

QUESTIONS 36 TO 40 ARE FREE RESPONSE.

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

36. In 450 years, the sculpture will be twice as old as it was 250 years ago.

What is the present age of the sculpture in years?

37. Sue has some buttons. If she arranges them in rows of either 2, 3, 4, 5 or 6, she has one button left over. If she arranges them in rows of 7, she has no buttons left over.

What is the least possible number of buttons that Sue has?

38. Mike made a number pattern by starting with the number 18 then adding 5 until he reached 688.

How many terms are there in Mike's pattern?

39. At a holiday resort people can rent a boat, a bicycle or both.

56 people rented a boat and 24 of those people also rented a bicycle. There were 48 people who did not rent a bicycle and 28 people who did not rent a boat.

A table was made to represent the data.

	Rented a boat	**Did not rent a boat**
Rented a bicycle		x
Did not rent a bicycle		

What is the value of x?

40. What is the value of the expression?

$$\frac{4^2 - 2 + 120 - 20 \times 0.6 \times 10}{(28 - 7 \times 2) \div (2000 \times 0.3)}$$

ICAS MATHS E 2013 – ANSWER KEY

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

Question Number	Paper E
31	A
32	D
33	C
34	C
35	A
36	950
37	301
38	135
39	12|012
40	600