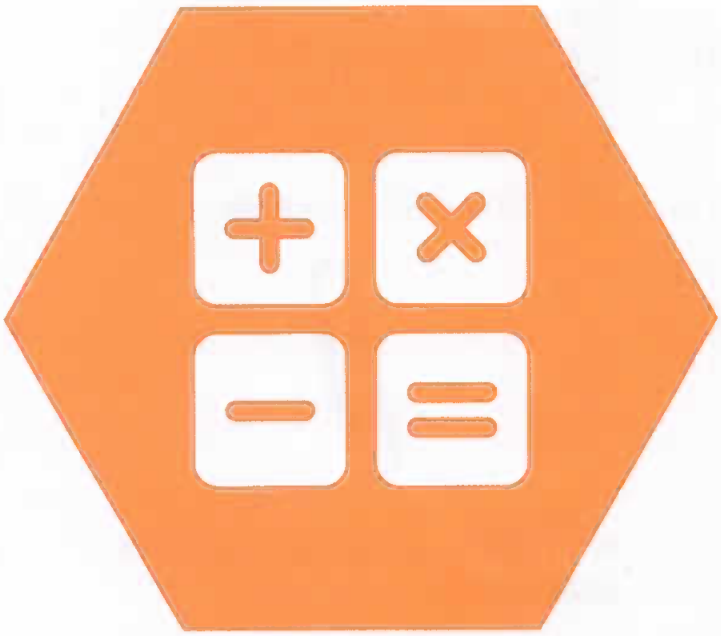
UNSW Global
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

PAPER D



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.

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1. It takes Mia four minutes to play a game of *Aliens and Robots*. She wants to know how many minutes it will take her to play six games of *Aliens and Robots*.

What should Mia do?

(A) add four and six
(B) subtract four from six
(C) multiply six by four
(D) divide six by four

2. This is a standard paper clip.

What is the approximate mass of this paper clip?

(A) 1 gram
(B) 1 milligram
(C) 3 millilitres
(D) 3 centimetres

3. Danny wrote this number sentence.

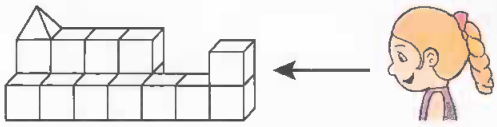
4 + ? = 16 + 5

Danny replaces the 5 with a larger number.

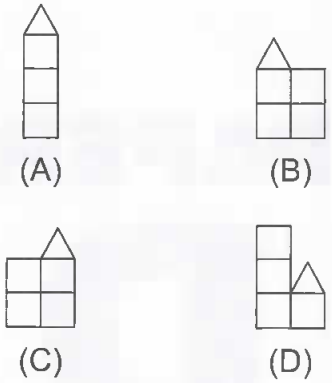
What does he need to do to the value of ? to keep the number sentence true?

(A) make it larger
(B) make it smaller
(C) not change it
(D) replace it by 5

4. Sue is looking at a stack of blocks as shown.

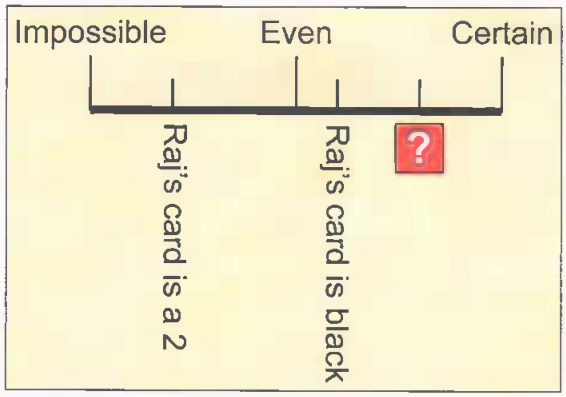


Which view does Sue see?



5. Raj has these five playing cards.

Raj mixes the cards and chooses one card without looking. The line shows the chance that some events will happen.



Which of these events could be put at ? on the line?

(A) Raj's card is a 9.
(B) Raj's card is red.
(C) Raj's card is a 5 or a 9.
(D) Raj's card is black or red.

6. In which of these options are the two lines parallel?

(A) 

(B) 

(C) 

(D) 

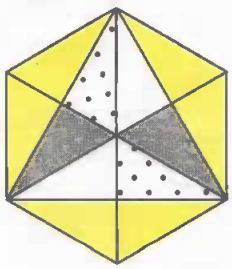
7. Danny, Edward and Mia won a cash prize. They shared the prize equally.

Each share was a whole number of dollars.

Which of these could be the total value of the prize?

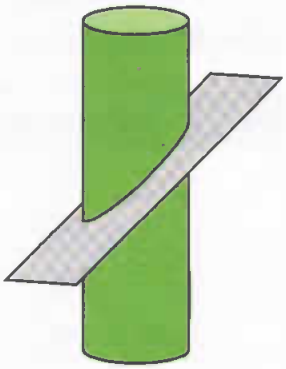
(A) $803
(B) $739
(C) $446
(D) $252

8. How many lines of symmetry does this picture have?



(A) 0
(B) 1
(C) 3
(D) 6

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. Raj weighed four bags of carrots and wrote down the mass of each one.

Which bag has the greatest mass?

1.1 kg
(A)

1.11 kg
(B)

1.019 kg
(C)

1.090 kg
(D)

11. The average height of students in a class is 130 centimetres (cm). Adam, Luisa, Sunil and Noor are students in this class. Their heights are given in the table.

Student	Height (cm)
Adam	120
Luisa	125
Sunil	130
Noor	145

One of these students is leaving school. As a result, the average height of this class will go down.

Who is leaving school?

(A) Adam
(B) Luisa
(C) Sunil
(D) Noor

12. Anna and Mia each shaded parts of two circles of the same size.

Anna's circle

Mia's circle

Edward also shaded parts of a circle of the same size. He shaded a greater area than Anna did, but a smaller area than Mia did.

Which of these could be Edward's circle?

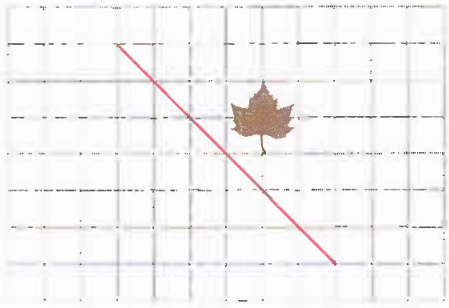
(A)

(B)

(C)

(D)

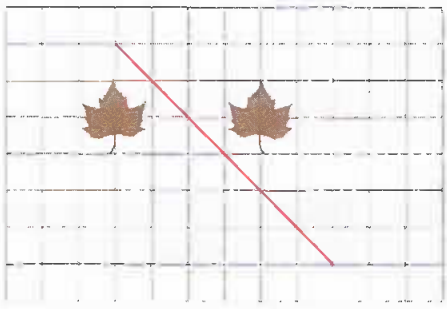
13. Danny drew a leaf on grid paper.



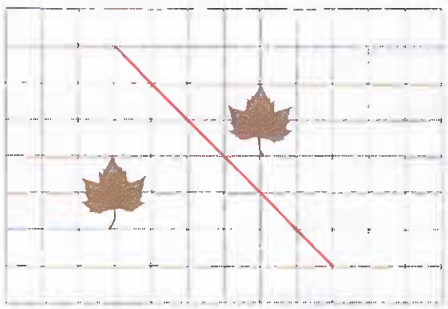
He reflected it in the line. He then translated it two squares to the left.

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

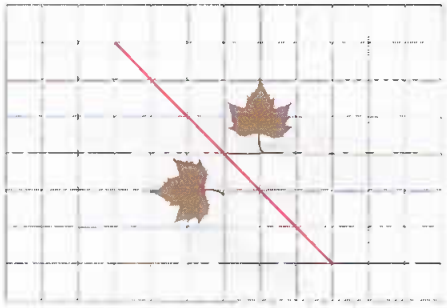
(A)



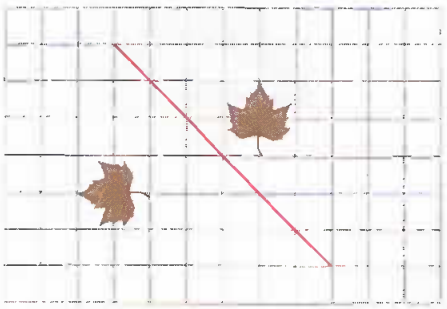
(B)



(C)



(D)



14. This table shows how long it took three adventurers to travel around the world.

Name	Time
Jess	410 days
Natalia	13 months
Tony	1.25 years

Which table lists the adventurers from fastest to slowest?

(A)

Name	Time
Natalia	13 months
Jess	410 days
Tony	1.25 years

(B)

Name	Time
Jess	410 days
Natalia	13 months
Tony	1.25 years

(C)

Name	Time
Jess	410 days
Tony	1.25 years
Natalia	13 months

(D)

Name	Time
Tony	1.25 years
Natalia	13 months
Jess	410 days

15. Sue counted the birds in a park. She noticed that there were only four types. In total, Sue recorded 140 birds.

She represented the results in this graph.

How many cockatoos did Sue record?

(A) 30
(B) 40
(C) 50
(D) 60

16.

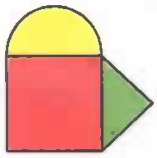


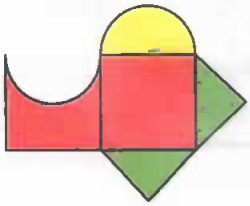
Figure A

Area = 50 cm^2

Figure B

Area = 42 cm^2

Figure C



Area = ?

What is the area of Figure C?

(A) 84 cm^2
(B) 92 cm^2
(C) 100 cm^2
(D) 117 cm^2

17. 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

18. Tony walked in a straight line from point A to point Z.

The distance from A to Z is 2400 m.

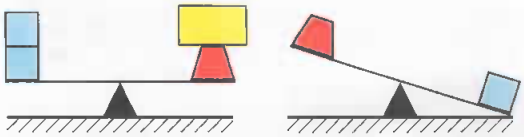
NOT TO SCALE

Tony stopped twice before reaching Z. First he stopped after 5000 cm at point B. Then after a further one km, he stopped at point C.

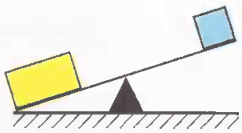
How far did Tony walk from point C to point Z, in km?

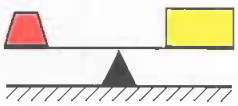
(A) 0.90
(B) 1.35
(C) 2.25
(D) 22.50

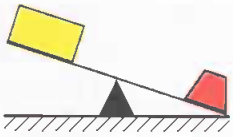
19. Mia placed these blocks on two balance beams.

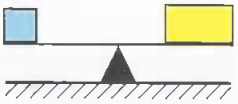


Which of these is correct?

(A) 

(B) 

(C) 

(D) 

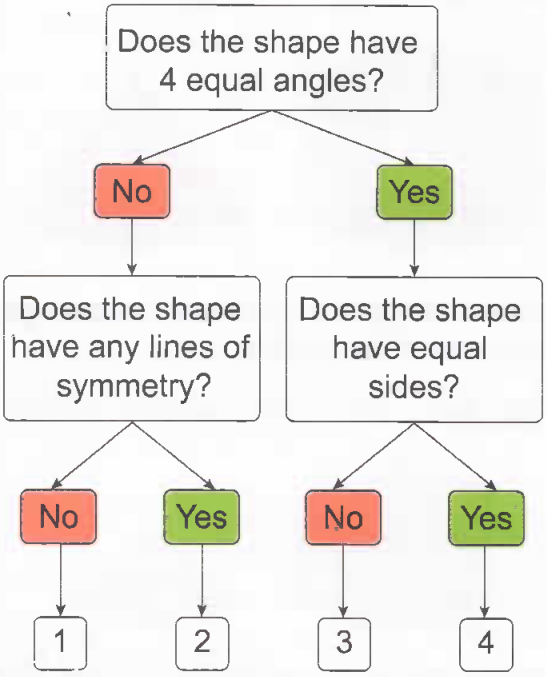
20. Danny had a jug with a capacity of 5 cups.

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

21. 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 (C) in 4

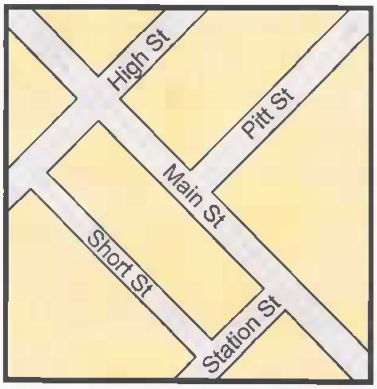
22. At the circus, 2 sticks of fairy floss cost the same as 3 lollipops.

If Sue buys one stick of fairy floss, she will have $1.50 left over. If Sue buys one lollipop, she will have $2 left over.

How much money does Sue have?

(A) $2.50
(B) $3.00
(C) $3.50
(D) $5.00

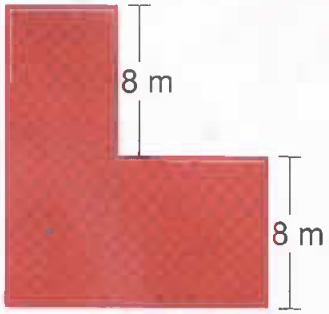
23. Edward is walking in a northerly direction along Pitt St towards Main St. When he reaches Main St, he turns right. Then he turns left into the next street and left again into the next street.



What direction will Edward then be facing?

(A) North (B) South
(C) East (D) West

24. Using only one cut, this shape can be divided into a rectangle and a square that have the same area.



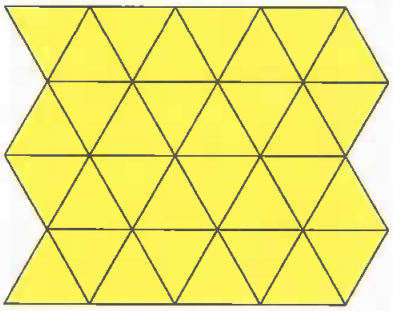
NOT TO SCALE

Which of the following can be the perimeter of this shape, in m?

(A) 52
(B) 56
(C) 64
(D) 72

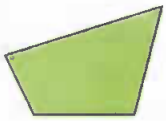
25. A tessellation is created when a shape is repeated over and over again, covering a flat surface without any gaps or overlaps.

This tessellation was made with equilateral triangles.

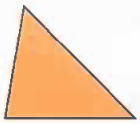


Which of these could NOT be used to make a tessellation?

(A)



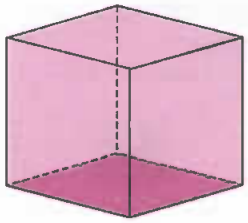
(B)

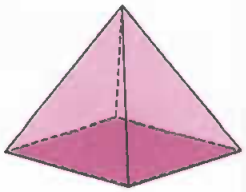


(C)

(D)

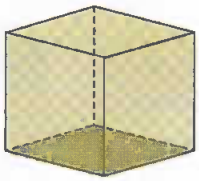
26. The cube and square pyramid below have the same height and base.

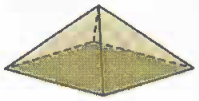




The volume of the cube is three times the volume of the pyramid.

Mia has a cube and a square pyramid.





Mia's shapes have the same base, but the cube is twice as high as the pyramid.

How many times greater than the volume of Mia's pyramid is the volume of Mia's cube?

(A) 8
(B) 6
(C) 4
(D) 2

27. Between which pair of numbers is 3.67?

(A) $3\frac{17}{25}$ and 3.76

(B) 3.5 and $\frac{18}{5}$

(C) $\frac{18}{5}$ and 3.76

(D) 3 and $3\frac{13}{20}$

28. The map shows three time zones on a large island.

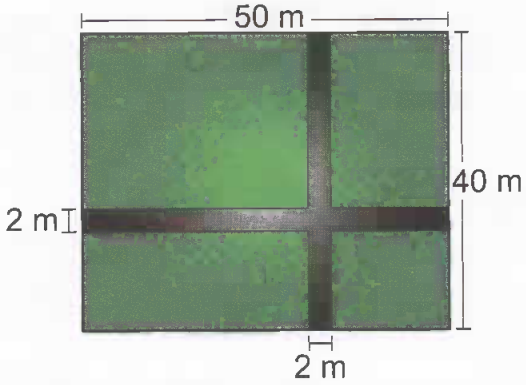
Central time zone is half an hour behind Eastern time zone. Western time zone is two and a half hours behind Central time zone.

Edward's plane leaves Watercliff at 8:30 am (Western time) to fly to Pirate Bay. The flight takes 4 hours and 15 minutes.

What time is it in Pirate Bay when Edward's plane arrives?

(A) 9:45 am (B) 12:45 pm
(C) 3:15 pm (D) 3:45 pm

29. Tony has a rectangular yard. The yard has two paths and four grass areas. One path is parallel to the longer side of the yard and the other is parallel to the shorter side.



NOT TO SCALE

What is the total area of the two paths, in square metres?

(A) 172
(B) 176
(C) 180
(D) 184

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

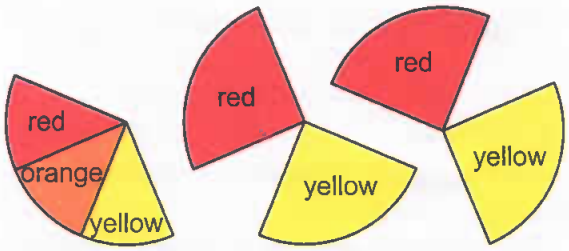
How many seconds will it take Anna to drive 100 m?

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

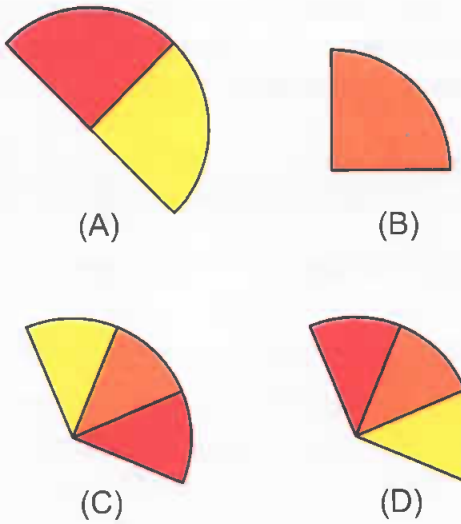
(C) $\frac{100 \times 1000}{50 \times 3600}$ (D) $\frac{1000 \times 3600}{50 \times 100}$

31. When red overlaps with yellow, it looks orange.

Here are the first three shapes in a pattern:



What is the next shape in this pattern?



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Australia	Year 6
Brunei	Primary 6
Indonesia	Year 7
Malaysia	Standard 6
New Zealand	Year 7
Pacific	Year 7
Singapore	Primary 5
South Africa	Grade 6

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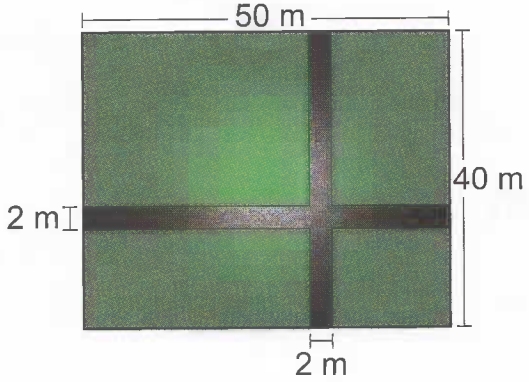

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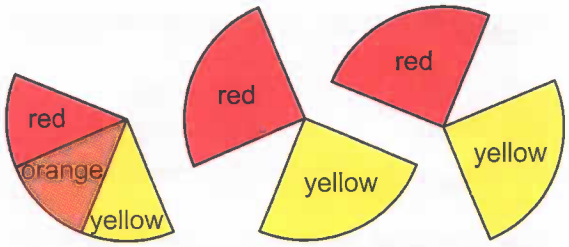
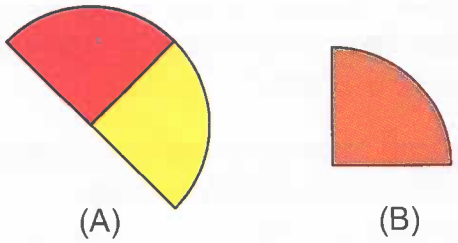
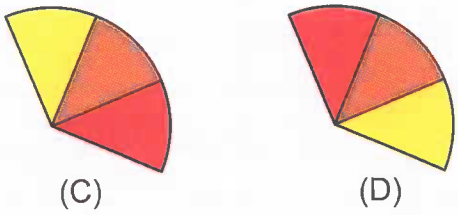


What is the next shape in this pattern?





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

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

33. Mia is a goal shooter in netball.

She scored 16 goals in the first game, 21 goals in the second game, 9 goals in the third game, 14 goals in the fourth game and 10 goals in the fifth game.

There were only 5 games.

How many more goals should Mia have scored to get an average of 16 goals?

(A) 16 (B) 14
(C) 10 (D) 2

34. 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.

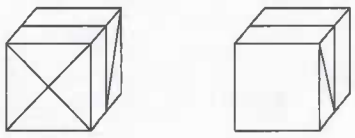
Binary number	Counters
1	
10	
11	
100	

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

35. This cube is made by gluing together six triangular prisms so that the joining edges show.

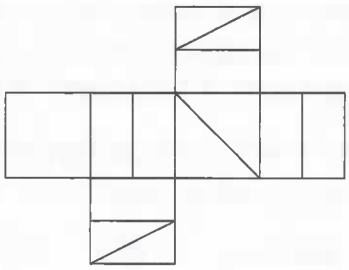


front back

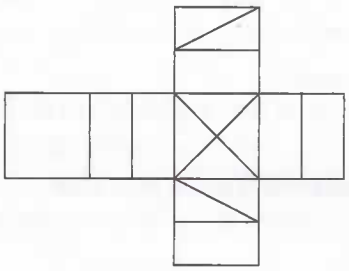
Raj wants to make a cardboard model of the cube with lines drawn on it to represent the edges of the six triangular prisms.

Which of these is a net of the above cube?

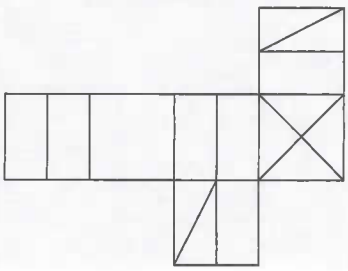
(A)



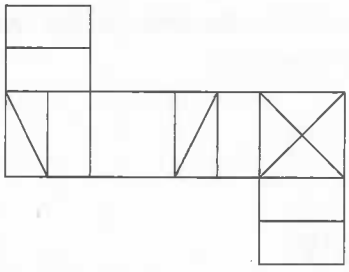
(B)



(C)



(D)



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.

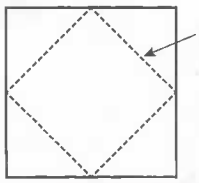
36. Mia works for a charity. She has to pack 120 shirts and 84 dresses into bags.

All bags must contain an equal number of shirts. All bags must also contain an equal number of dresses. All items must be packed.

What is the greatest number of bags Mia can make?

37. Raj has a square piece of paper that is white on the front and grey on the back.

The perimeter of the square paper is 64 cm.



Raj folds the corners of the square along the fold lines. This makes a smaller square.

What is the area of the smaller square in cm^2?

38. What value of ? makes this number sentence correct?

$$18^2 \times \frac{40}{?} = 144$$

39. Sue wants to get 50 seedling pots for her garden.

The nursery has a special offer.

How many dollars should Sue pay for 50 seedling pots?

40. Edward has five red and six blue containers full of liquid. He also has three empty green containers.

Containers with the same colour have the same capacity.

The table lists the capacity of some of the containers.

Colour of container	Capacity (mL)
red	120
blue	135
green	?

Edward poured all the liquid from the containers into a jug. He then poured all the liquid into the green containers. The green containers were then full.

How many mL greater than the capacity of a red container is the capacity of a green container?

Acknowledgment

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The following year levels should sit THIS Paper:

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Brunei	Primary 6
Indonesia	Year 7
Malaysia	Standard 6
New Zealand	Year 7
Pacific	Year 7
Singapore	Primary 5
South Africa	Grade 6

PAPER D

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

(Please turn over)

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31	A	B	B	D	A	C	C	A
32	D	B	A	B	D	C	B	B
33	C	C	C	C	C	B	B	D
34	C	A	D	D	C	B	D	A
35	A	B	C	C	A	C	C	C
36	A	C	D	12|012	950	6|006|06	6|006|06	10|010
37	C	D	C	128	301	98|098	4|004|04	4|004|04
38	A	A	B	90|090	135	10|010	216	351
39	D	A	B	126	12|012	90|090	127	104
40	A	B	C	350	600	16|016	18|018	65|065

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