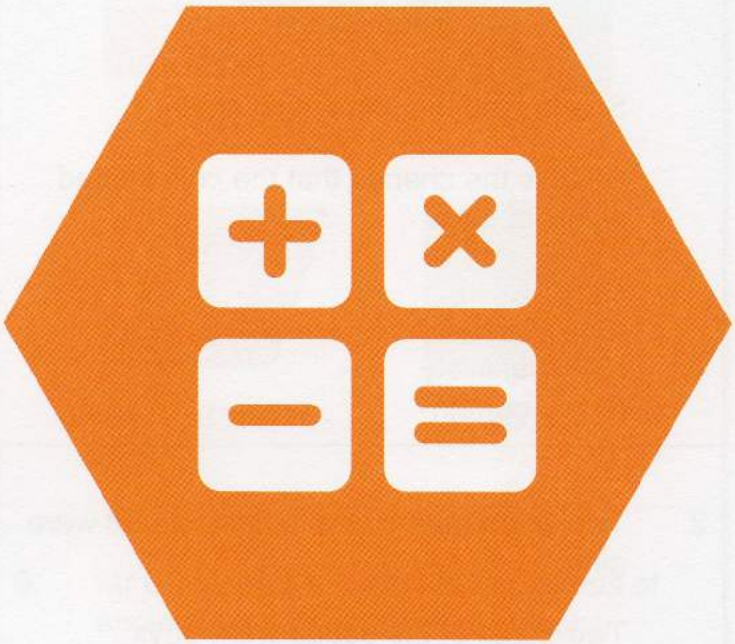
UNSW Global
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

PAPER E



2014 ICAS

International Competitions and Assessments for Schools

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**.

MATHEMATICS

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. Mandy tossed a fair coin. It landed showing heads.

She tossed the same coin again.

What is the chance that the coin landed showing tails?

(A) even
(B) likely
(C) unlikely
(D) certain

2. Twelve members of a football squad were girls.

Two-thirds of the squad were boys.

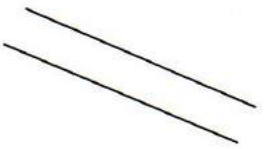
How many members are in this football squad?

(A) 36
(B) 24
(C) 20
(D) 18

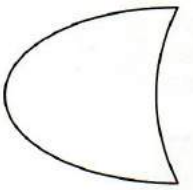
3. A polygon is a closed shape that is made up of straight lines.

Which of the following is a polygon?

(A)



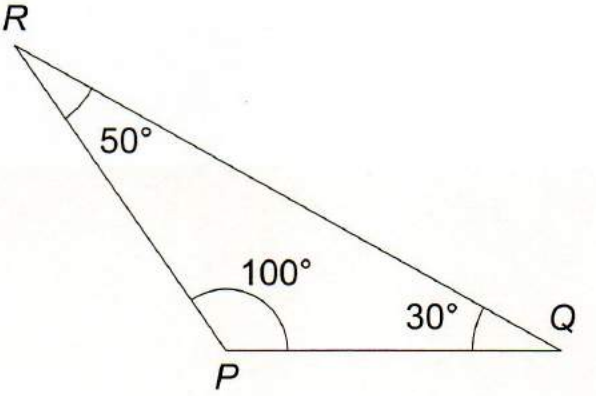
(B)



(C)

(D)

4. Which statement about this triangle is correct?



(A) Angle P is the only acute angle.
(B) Angle R and angle Q are the only acute angles.
(C) Angle Q is the only obtuse angle.
(D) Angle R and angle P are the only obtuse angles.

5. Which of the following units of measurement can be used to represent volume?

(A) cm
(B) cm^2
(C) cm^3
(D) cm^4

6. Anish and Natalia have some cards.

Anish would have four times as many cards as Natalia if Natalia gave him some of her cards.

If Anish gave Natalia nine of his cards they would have an equal number of cards.

How many cards does each person have?

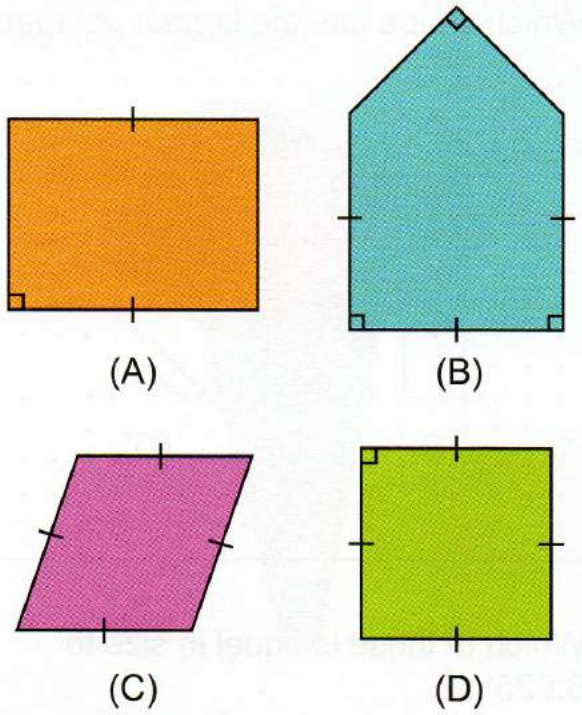
	Anish	Natalia
(A)	12	30
(B)	21	39
(C)	30	12
(D)	39	21

7. Sam bought a bicycle for his son and a car for himself. The bicycle cost $800 and the car cost $8000.

How many times greater than the cost of the bicycle was the cost of the car?

(A) 10
(B) 80
(C) 100
(D) 7200

8. Which shape has four equal sides and at least one right angle?



(A) (B)

(C) (D)

9. Mr Goodnell's truck holds 0.5 tonnes of apples. He delivers to twelve shops.

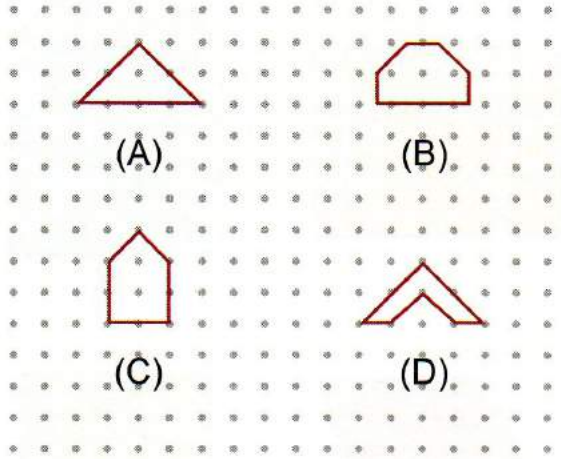
Each shop has 37 kg of apples delivered to it.

What mass of apples are left over after the last delivery?

(A) 56 kg
(B) 66 kg
(C) 130 kg
(D) 463 kg

10. Four shapes were drawn on square dot paper.

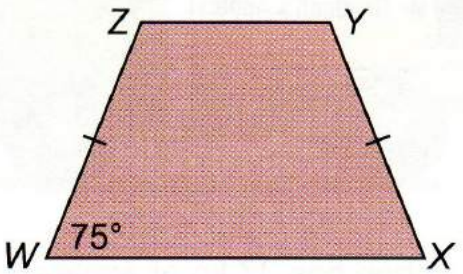
Which shape has the largest perimeter?



11. Which of these is equal in size to 6.025 m?

(A) 60.25 mm
(B) 60.25 cm
(C) 602.5 mm
(D) 602.5 cm

12. *WXYZ* is a trapezium.



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What are the sizes of the other three angles in the trapezium?

	Angle *X*	Angle *Y*	Angle *Z*
(A)	75°	95°	95°
(B)	75°	105°	105°
(C)	95°	75°	95°
(D)	105°	75°	105°

13. There was a box of 30 toy dinosaurs. The table shows what types and colours of toy dinosaurs were in this box.

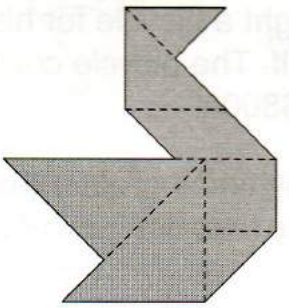
	Red	Green	Pink	Blue
Diplodocus	1	1	0	1
Stegosaurus	2	4	1	1
Triceratops	3	0	0	1
Allosaurus	4	1	0	0
Velociraptor	2	4	2	2

Which type of toy dinosaur made up one-third of the contents of this box?

(A) Diplodocus
(B) Triceratops
(C) Allosaurus
(D) Velociraptor

14. A square is cut along the dotted lines.

The pieces are rearranged to form the shape of a swan.



Which statement is true?

(A) The perimeters and areas of both the square and swan are the same.
(B) The perimeters of the square and swan are different but their areas are the same.
(C) The perimeters of the square and swan are the same but their areas are different.
(D) The perimeters and areas of both the square and swan are different.

15. Mike had a list of square numbers that were less than 100. He added 1 to each of these and obtained a new list of numbers. Some of the new numbers were prime numbers.

How many prime numbers less than 100 were there in Mike's new list?

(A) 3
(B) 4
(C) 5
(D) 6

16. Samantha bought $1\frac{1}{4}$ kg of apricots.

She gave her brother two-fifths of these.

What mass of apricots did Samantha have left?

(A) $\frac{1}{2}$ kg (B) $\frac{3}{5}$ kg

(C) $\frac{3}{4}$ kg (D) $1\frac{3}{20}$ kg

17. Raj was born on 15 May 2003. Sue was born on 3 December 2002.

How many days older than Raj is Sue?

(A) 162
(B) 163
(C) 165
(D) 166

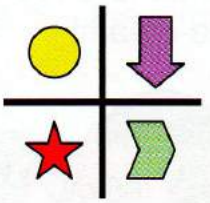
18. Kerry bought an ice-cream cone. It had a 65 mL scoop of strawberry, a 65 mL scoop of peppermint and a 130 mL scoop of chocolate ice-cream.

Each 65 mL of ice-cream has a mass of 35 g. The cone weighs 30 g.

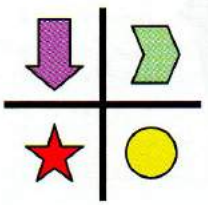
What is the total mass of the ice-cream cone Kerry bought?

(A) 170 g
(B) 290 g
(C) 325 g
(D) 390 g

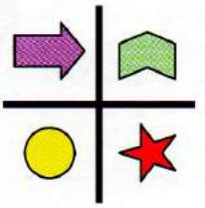
19. Bill drew this picture. Then he gave it a three-quarter turn in a clockwise direction.



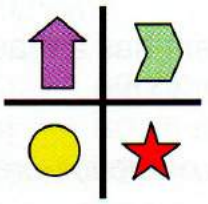
Which of these shows the picture after the turn?



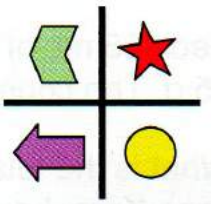
(A)



(B)



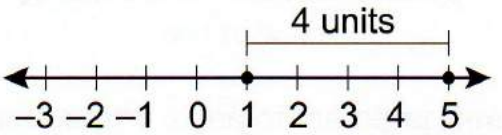
(C)



(D)

20. The mathematical expression $|M - N|$ describes the distance from M to N along the number line.

For example, if $M = 1$ and $N = 5$, then $|M - N| = 4$.



Anish selected other numbers for M and N and the result of $|M - N|$ was 6.

Which two numbers could Anish have selected?

(A) 4 and 2
(B) 7 and 2
(C) 3 and 9
(D) 3 and 3

21. There are fewer than 30 students in Mr Chan's mathematics class. On his students' reports Mr Chan gives a grade of A, B, C, D or E.

This year, one-third of the class got an A, one-quarter of the class got a B, four students got a C and three students got an E.

How many students got a D?

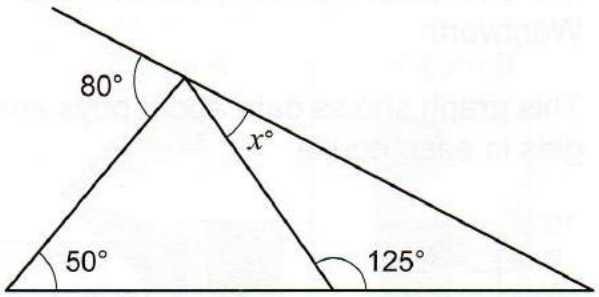
(A) 2
(B) 3
(C) 4
(D) 5

22. Aidan made a decoration. He used a 990 cm piece of string and three different types of crystals. Every 15 cm he put a crystal onto the string in the sequence shown. He did this until he reached the end of the string.

How many crystals like this  did Aidan use?

(A) 66
(B) 44
(C) 33
(D) 22

23. What is the value of x?



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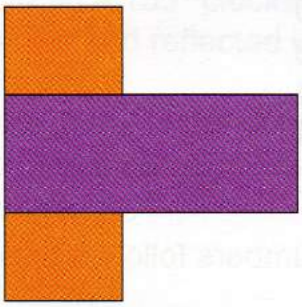
(A) 55
(B) 50
(C) 25
(D) 20

24. Tala overlapped two rectangles to make a new shape as shown. Each rectangle was 4 cm by 10 cm.



What is the area of the new shape?

(A) 80 cm^2
(B) 64 cm^2
(C) 48 cm^2
(D) 40 cm^2

25. The owner of a shoe store did an annual stock count. He counted 200 pairs of sports shoes.

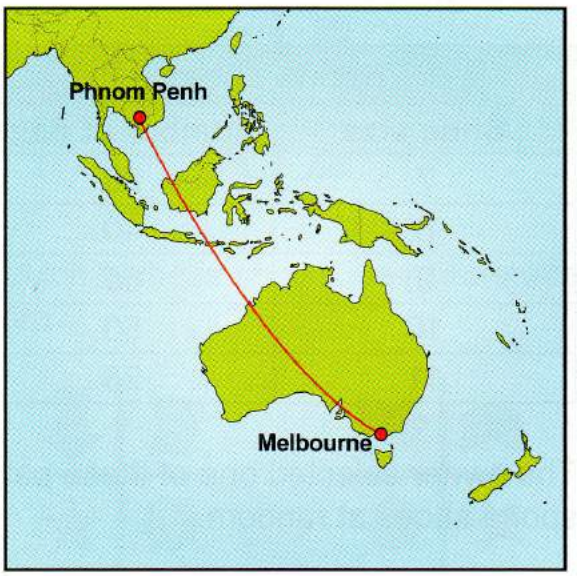
Sports shoes	
Shoe size	**Number of pairs**
7	20
8	40
9	65
10	50
11	25

The owner selected one of these pairs of sports shoes at random.

What is the chance that this pair of shoes is size 9 or larger?

(A) 30%
(B) 40%
(C) 70%
(D) 90%

26. Lucia flew from Melbourne to Phnom Penh.



She left Melbourne at 9:55 am.

The time in Phnom Penh is four hours behind the time in Melbourne.

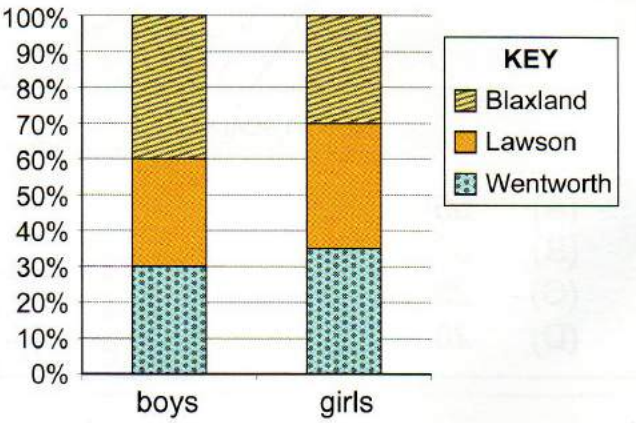
She arrived in Phnom Penh at 7:28 pm.

How long was Lucia's trip?

(A) 7 hours 33 minutes
(B) 9 hours 33 minutes
(C) 11 hours 13 minutes
(D) 13 hours 33 minutes

27. A school of 180 boys and 160 girls has 3 houses: Blaxland, Lawson and Wentworth.

This graph shows data about boys and girls in each house.



How many more boys than girls are there in Blaxland House?

(A) 10
(B) 18
(C) 24
(D) 34

28. These numbers follow a pattern.

$$\frac{1}{48}, \frac{1}{24}, \frac{1}{12}, \frac{1}{6}, \frac{1}{3}, ?$$

What is the next term in this pattern?

(A) $\frac{3}{2}$

(B) 1

(C) $\frac{2}{3}$

(D) $\frac{1}{2}$

29. Sara performed two transformations on Figure A to produce Figure B.

Figure A

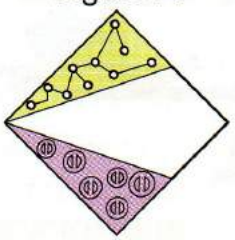
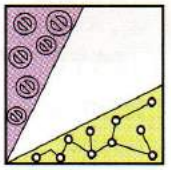


Figure B



Which two transformations did Sara perform on Figure A?

(A) reflected it in the dotted line and rotated it 135° clockwise about its centre
(B) rotated it 45° clockwise about its centre and reflected it in the dotted line
(C) rotated it 135° clockwise about its centre and reflected it in the dotted line
(D) reflected it in the dotted line and rotated it 45° clockwise about its centre

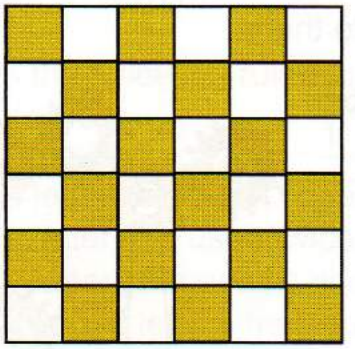
30. Yolanda picked four numbers. The mean of her numbers was 8.

Two of the numbers were 7 and 15.
The other two numbers were identical.

What was the value of each of the identical numbers?

(A) 5
(B) 8
(C) 10
(D) 11

31. A board has squares on it as shown.



How many squares, of any size, can be traced on this board?

(A) 37 (B) 41
(C) 91 (D) 182

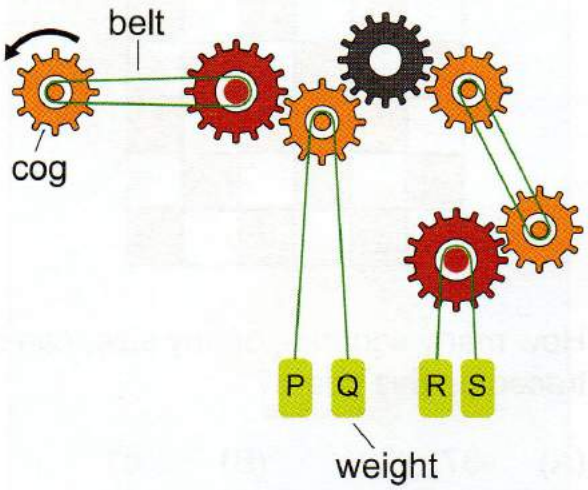
32. A number is called abundant if the sum of its factors, not including the number itself, is greater than the number.

For example, the sum of the factors of the number 12 (not including the number 12 itself) is 1 + 2 + 3 + 4 + 6 = 16. This sum is greater than 12 so the number 12 is an abundant number.

How many abundant numbers are there between 15 and 25?

(A) 11
(B) 4
(C) 3
(D) 0

33. Jack built this machine using cogs and belts. He connected four weights P, Q, R and S to them.



One of the cogs was turned as shown.

Which two weights then moved upward?

(A) P and S
(B) P and R
(C) Q and S
(D) Q and R

34. What is another way of writing the expression $x \div 2 \div 3$?

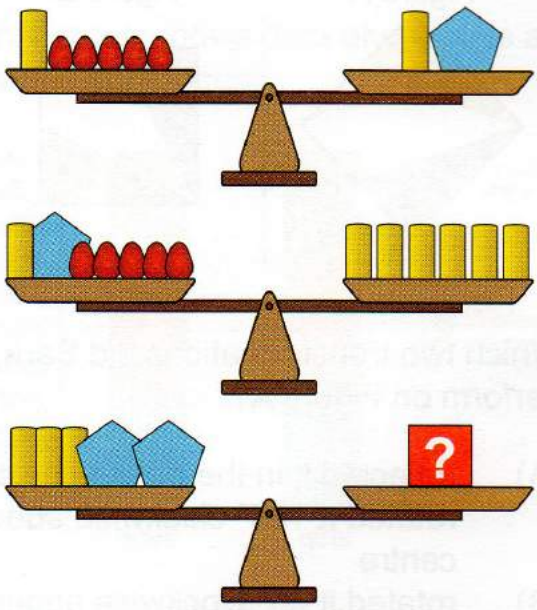
(A) $\frac{3x}{2}$

(B) $\frac{2x}{3}$

(C) $\frac{x}{5}$

(D) $\frac{x}{6}$

35. There are some objects on each set of scales. Each object of the same shape has the same mass.



How many 🔴 are needed to balance the last set of scales?

(A) 13
(B) 16
(C) 18
(D) 25

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. A water sports store hires out wetsuits and diving equipment. The cost to hire a wetsuit is one-third of the cost to hire diving equipment.

Dave hired both a wetsuit and diving equipment for the same length of time and paid a total of $144.

How much did he pay for the hire of the wetsuit in dollars?

37. Xiang chose a positive whole number. She squared it, added 5 and then divided the answer by 3. Her result was 58.

What number did Xiang choose?

38. Alice wrote three consecutive even numbers. The sum of these numbers was 252.

Pat wrote three consecutive odd numbers. Pat's numbers were larger than Alice's numbers.

The difference between the largest of Pat's numbers and the largest of Alice's numbers was 25.

What was the sum of Pat's numbers?

39. Sam has the letters S, A, and M to make a five-letter password.

He uses the following rules for letters in his password:

- The letter S is used once.
- The letter A is used twice.
- The letter M is used twice.
- The two M letters have to be either both in even-numbered positions or both in odd-numbered positions.

How many different passwords can Sam make?

40. Mary is ordering food from a new website called z-Bay. The z-Bay website is based on the planet Zlot where the currency is called the zlotter (Ƶ).

The number system on Zlot is based on 8 instead of 10. For example on Zlot '53' means 5×8+3 but on Earth '53' means 5×10+3.

Mary's computer screen shows she is spending 45 zlotters on pizza and her total order is 100 zlotters.

How many zlotters will the computer show for the cost of Mary's soft drink?

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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

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

(Please turn over)

M | 2014 Mathematics Answer Keys

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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	C	D	D	A	C	A	C	C
32	D	D	C	B	C	B	A	B
33	A	A	A	B	A	C	D	D
34	B	B	C	D	D	B	A	D
35	A	D	B	A	B	C	B	C
36	D	D	C	82|082	36|036	327	120	120
37	A	C	B	21|021	13|013	256	41|041	864
38	B	A	C	92|092	327	21|021	83|083	478
39	C	D	B	125	12|012	640	864	540
40	C	C	C	24|024	33|033	41|041	45|045	36|036

Contact Details
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Website: www.eaa.unsw.edu.au

ICAS MATHS PAPER E 2014 – ANSWER KEY

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

Question Number	Paper E
31	C
32	C
33	A
34	D
35	B
36	36|036
37	13|013
38	327
39	12|012
40	33|033