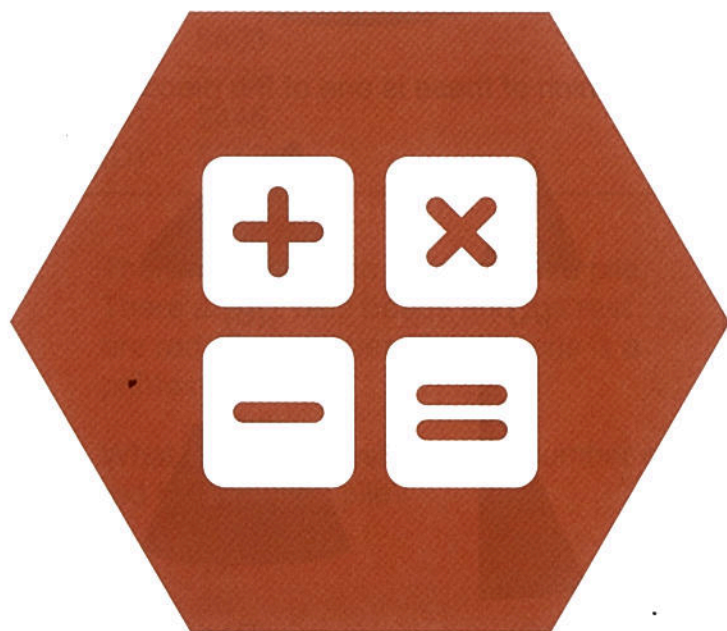




UNSW Global  
AUSTRALIA

# PAPER D



2015  
ICAS

International Competitions  
and Assessments for Schools

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MATHEMATICS

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Educational Assessment Australia  
[eaa.unsw.edu.au](http://eaa.unsw.edu.au)

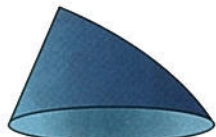
1. This cone is cut into two identical pieces.



Which of these is one of the pieces?



(A)



(B)



(C)

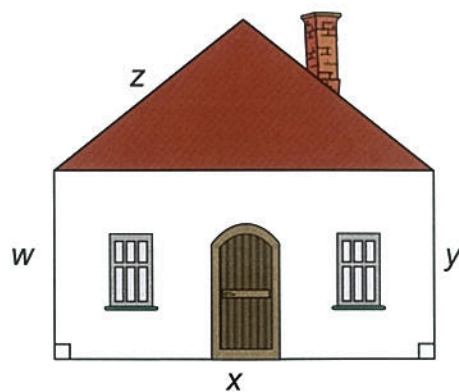


(D)

2.  $12 \times 8 = 24 \times$  ?

- (A) 3
- (B) 4
- (C) 8
- (D) 16

3. John drew a picture of his house.



Which sides are parallel to each other on John's drawing?

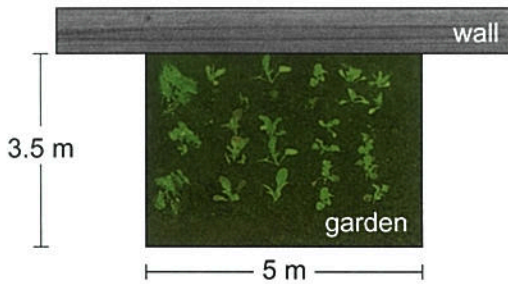
- (A) x and y
- (B) x and z
- (C) w and z
- (D) w and y

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



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

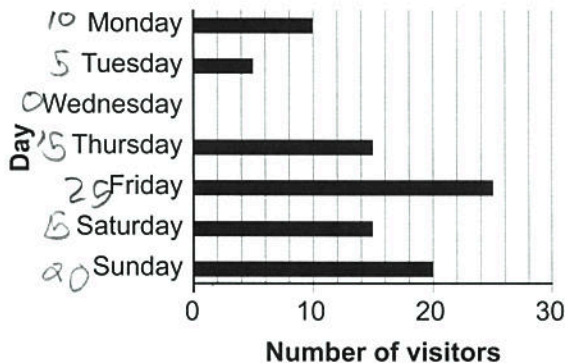
5. Henry built a rectangular garden against a wall.



What length of fencing is needed to enclose the garden?

- (A) 8.5 metres
- (B) 12 metres
- (C) 17 metres
- (D) 17.5 metres

6. Ann counted the number of people who visited a park over the past week. She showed this data in a graph.



Ann noticed that half of the total number of visitors came over two days.

Which two days were these?

- (A) Monday and Thursday
- (B) Friday and Saturday
- (C) Friday and Sunday
- (D) Saturday and Sunday

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

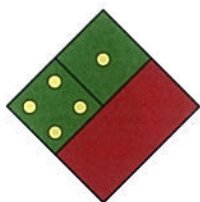
8. There are less than 40 beads in a pile. There are 17 blue beads and the rest are red. The number of red beads is a prime number.

What is the greatest possible number of red beads in the pile?

- (A) 17
- (B) 19
- (C) 21
- (D) 23

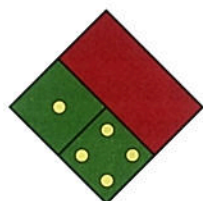


9. Janice drew this shape.

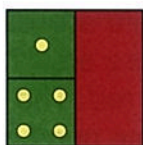


Janice rotated it anticlockwise by a quarter of a turn.

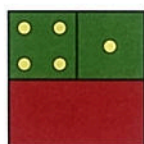
Which of these shows the shape after this rotation?



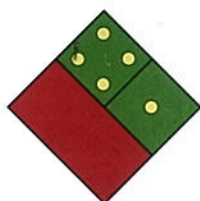
(A)



(B)



(C)



(D)

10. Johann has two dice, each with four faces numbered 1 to 4.

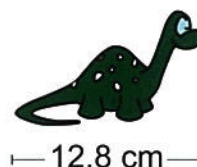
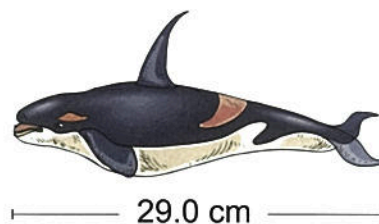


He rolls the dice and uses the number on each base to make a 2-digit number.

How many possible 2-digit numbers can Johann make?

- (A) 4 (B) 8  
(C) 16 (D) 36

11. Matteo has one toy killer whale and three identical toy dinosaurs. The lengths of these two types of toys are shown.



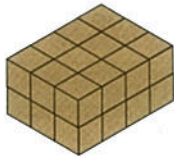
What was the total length of Matteo's four toys, in centimetres?

- (A) 41.8  
(B) 57.4  
(C) 65.8  
(D) 67.4

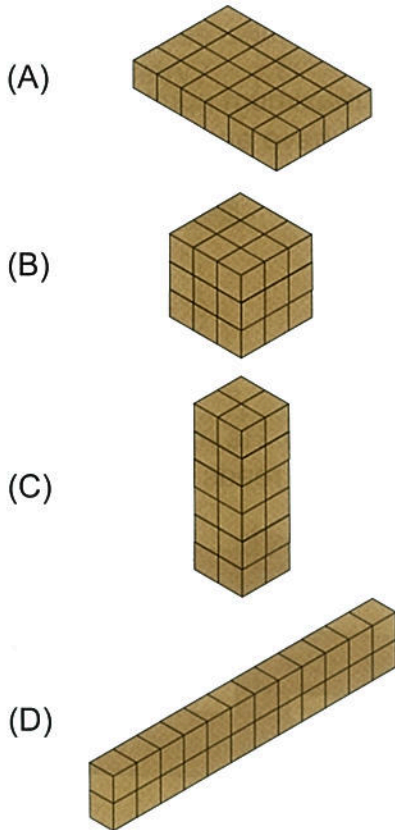
12. Which set of properties is true for a square-based pyramid?

	Edges	Faces	Vertices
(A)	12	6	8
(B)	8	5	5
(C)	6	5	4
(D)	4	4	5

13. Jack made this prism.



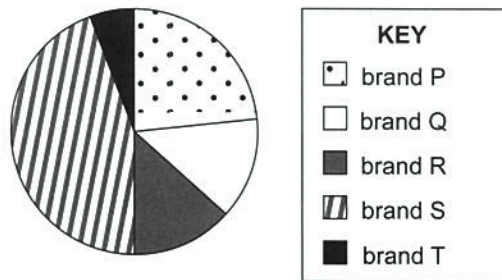
Which one of the following prisms has a volume **DIFFERENT** from the one Jack built?



14.  $3^2 \times 3^2 = ?$

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

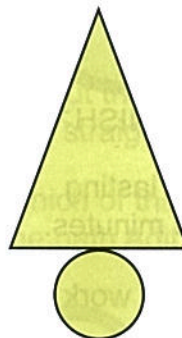
15. This sector graph summarises smartphone sales by brand.



Which of these statements about smartphone sales is correct?

- (A) Together, brands Q and R made up just over one-quarter of the sales.
- (B) More brand S were sold than all of the other brands combined.
- (C) Fewer brand R were sold than brand T.
- (D) Just less than 90% were brand P.

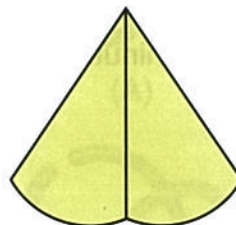
16. Which of these is the net of a cone with no base?



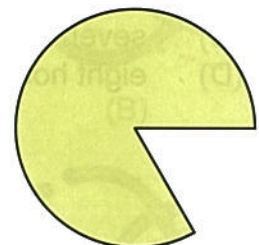
(A)



(B)

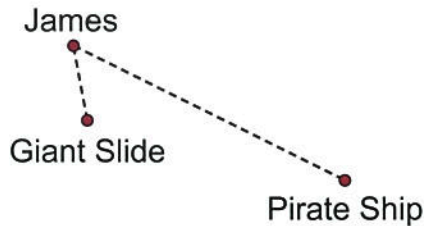


(C)



(D)

17. James was at a theme park.  
He was 300 metres from the Pirate Ship.



Using this map, approximately how far was James from the Giant Slide?

- (A) 125 metres
- (B) 100 metres
- (C) 75 metres
- (D) 50 metres

18. On Saturday, Farai worked on a project.  
The diagram shows when he started and finished his project.



He took a break for lunch lasting one hour and twenty-five minutes.

How long did Farai actually work on his project?

- (A) six hours and forty-five minutes
- (B) seven hours and fifteen minutes
- (C) seven hours and forty-five minutes
- (D) eight hours and ten minutes

19. Bill took part in a quiz.

There were three types of questions.

Question type	Points
knowledge	10 2
skill	1 5
application	2 7

Bill scored 39 points.

$$20 + 5 + 14 = 39$$

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

- (A) 14
- (B) 17
- (C) 18
- (D) 19

20. Pete is at the zoo. He meets his friends at a kiosk where he reads this sign.



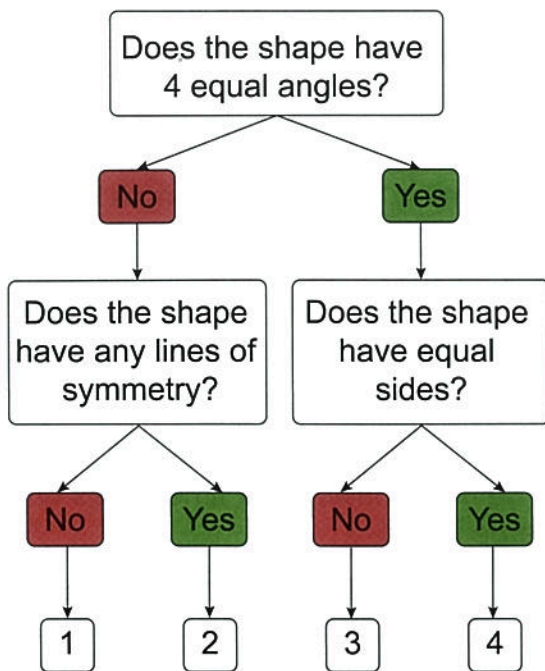
They decide to visit the lions, giraffes and zebras in that order. These three animal exhibits lie on the same straight path.

How far will they walk from the kiosk to where they will finish at the zebras?

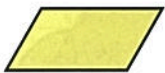
- (A) 750 metres
- (B) 830 metres
- (C) 910 metres
- (D) 990 metres



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



Anna used the chart to sort this shape.



Where should Anna put the shape?

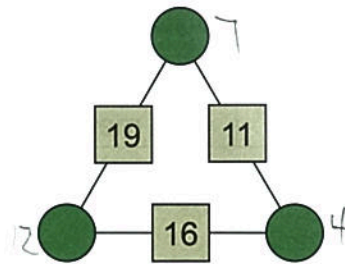
- (A) in 1      (B) in 2  
(C) in 3      (D) in 4

22. What is the missing number?

$$\frac{1}{16}, \frac{1}{8}, \frac{3}{16}, \frac{1}{4}, \frac{5}{16}, \text{?}$$

- (A)  $\frac{5}{4}$       (B)  $\frac{3}{4}$   
(C)  $\frac{5}{8}$       (D)  $\frac{3}{8}$

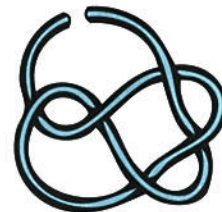
23. The number in each square is equal to the sum of the numbers in the circles joined to the square.



What is the sum of the numbers in the circles?

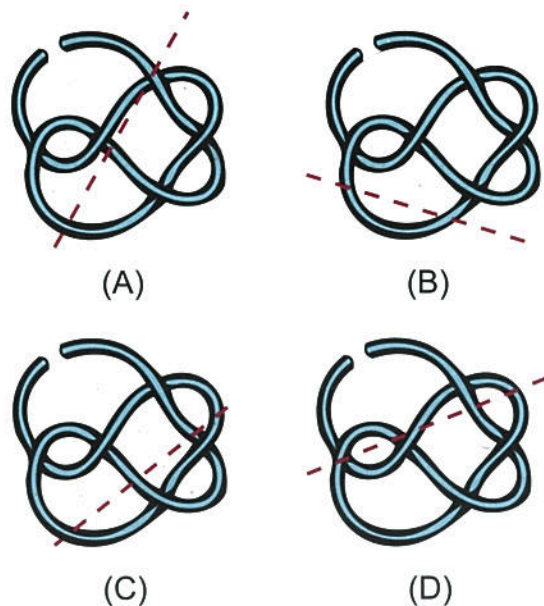
- (A) 17  
(B) 23  
(C) 24  
(D) 46

24. Aditya had this tangled piece of wool.



He cut the wool into 7 pieces using one straight cut.

Which of the following diagrams shows the path Aditya took to cut the wool?



25. Maria is creating some decorations out of ribbon. She has these pieces of ribbon:

Colour	Length
Red	3.5 metres ✕
White	45 centimetres
Blue	1.2 metres

She decides not to use the red ribbon.

She uses one-third of her white ribbon and half of her blue ribbon.

How much ribbon does she use altogether?

- (A) 15.6 centimetres
- (B) 55 centimetres
- (C) 75 centimetres
- (D) 82.5 centimetres

26. Today, Jackie's bean plant has 10 leaves.



Jackie's bean plant grows 2 new leaves every 3 days and loses none.

How many more days will it be before her plant has 40 leaves?

- (A) 60
- (B) 45
- (C) 27
- (D) 20

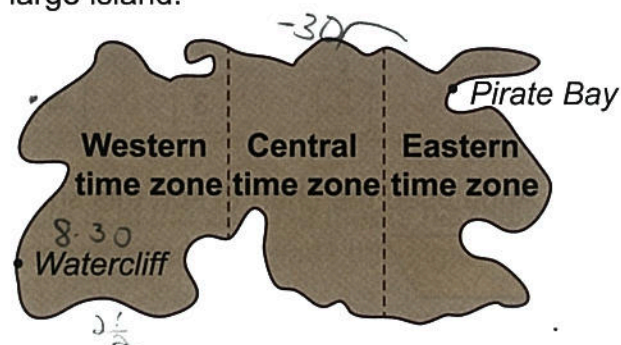
27. A group of 60 students went to the beach. Of the 34 students who brought a hat, 25 were boys.

There were 36 boys altogether.

How many girls did not bring a hat?

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

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.

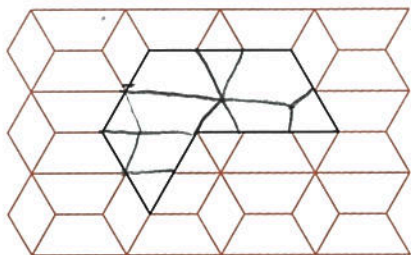
Edward's plane leaves Watercliff at 8:30 am (Western time) to fly to Pirate Bay. The flight takes 4 hours and 15 minutes.

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

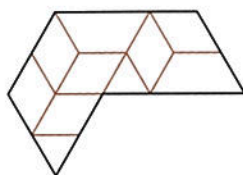
- (A) 9:45 am
- (B) 12:45 pm
- (C) 3:15 pm
- (D) 3:45 pm



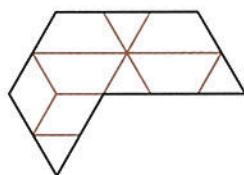
29. The section, outlined in black, represents a missing piece in this pattern.



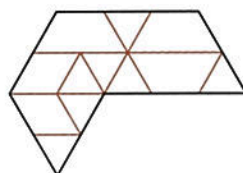
Which of these is the missing piece?



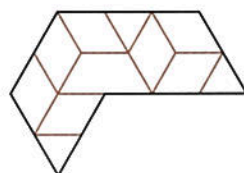
(A)



(B)



(C)

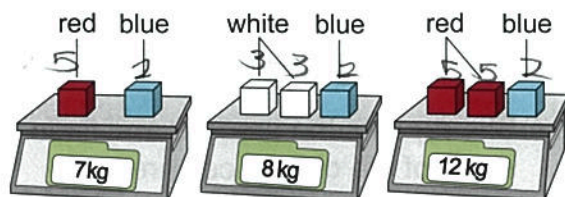


(D)

30. Manu has some cubes in three different colours.

Cubes of the same colour have the same mass.

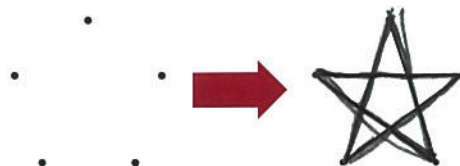
She weighs the cubes.



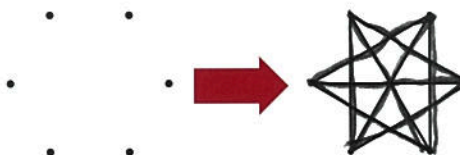
What is the mass of one white cube, in kilograms?

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

31. Jan created this 5-point star.



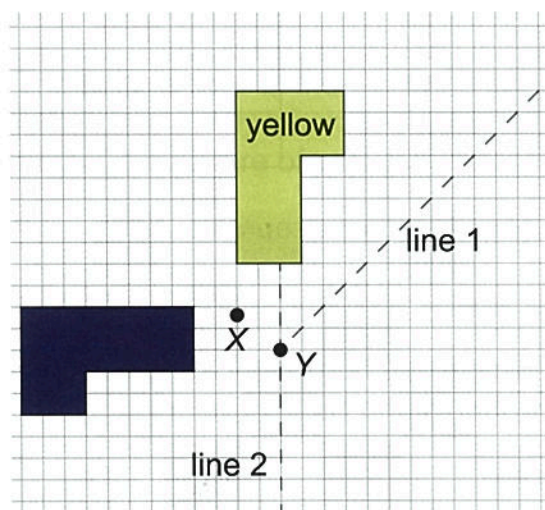
She used 9 lines to create this 6-point star.



How many lines join the dots in Jan's 10-point star?

- (A) 35 (B) 29  
(C) 28 (D) 26

32. 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  $180^\circ$  about Y  
(B) reflect in line 1 and rotate  $180^\circ$  about X  
(C) reflect in line 2 and rotate  $180^\circ$  about Y  
(D) reflect in line 2 and rotate  $180^\circ$  about X

33. 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

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	

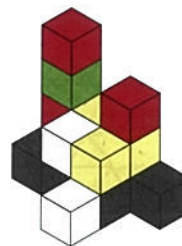
Anna has these counters.



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

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

35. Cai made this solid with 16 cubes.



How many faces of these cubes are on the outside of this solid, including the base?

- (A) 56  
(B) 52  
(C) 50  
(D) 44

**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. Ivy has these four cards.



She picks two cards to make a 2-digit number. The other cards make another 2-digit number.

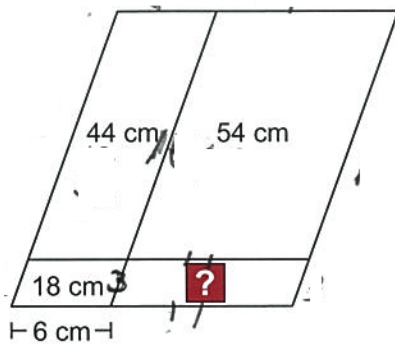
Ivy subtracts the smaller number from the larger number to find the difference.

She repeats the process and finds that some of the differences are odd.

How many of the possible differences are odd?



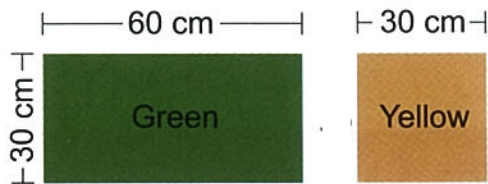
37. This parallelogram has been divided into 4 smaller parallelograms.



The perimeters of three of the smaller parallelograms are given.

What is the perimeter of the parallelogram marked with a ?, in centimetres?

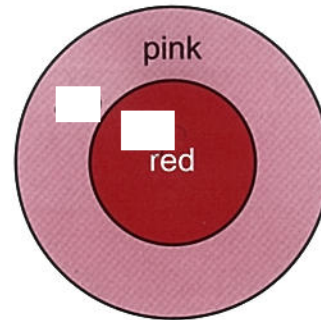
38. Juliet had some rectangular pieces of green glass and one square piece of yellow glass.



She placed the yellow piece in the middle of a square window frame, with a side length of 150 centimetres, and surrounded it with the green glass to fill the frame. No glass was cut.

How many pieces of green glass did Juliet use?

39. Fadi, Mike and Joe all shot arrows at the target shown in the diagram.



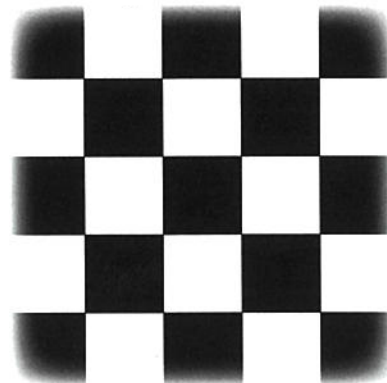
Fadi shot 4 arrows into the red section and 2 arrows into the pink section. His score was 240.

Mike shot 3 arrows into the red section and 1 arrow into the pink section. His score was 170.

Joe shot 1 arrow into the red section and 2 arrows into the pink section.

What was Joe's score?

40. The square floor of the Concert Hall was retiled using only black and white tiles. Below is a picture of part of this floor.



The Concert Hall has an area of 324 square metres.

Each black or white square has sides of 2 metres and is made up of 16 smaller tiles of the same colour.

More black tiles than white tiles were used.

How many small white tiles were used?



# 2015 Maths Answer Key Y6 paper D

## ANALYSIS BY QUESTION

The following table shows the questions you answered correctly ☒ and shades the questions that you answered incorrectly ☐. The questions are ranked from hardest at the top to easiest at the bottom.

	Question content	Area assessed	Question number	Correct answer
Difficult Questions	Solve a problem involving a tiling pattern	Number & Arithmetic	40	640
	Find the number of differences which are odd	Chance & Data	36	6
	Arrange shapes to minimise wastage	Measures & Units	38	12
	Calculate the perimeter of a parallelogram	Measures & Units	37	28
	Determine the transformation needed to result in a given orientation	Space & Geometry	32	A
	Identify and apply a pattern	Algebra & Patterns	31	A
	Determine the number of faces on a solid	Space & Geometry	35	B
	Find the length of a particular path	Number & Arithmetic	20	C
	Identify the properties of a given quadrilateral using a diagram	Space & Geometry	21	A
	Identify prime numbers in context	Number & Arithmetic	8	B
	Solve a problem involving multiples of 2, 5 and 7	Algebra & Patterns	19	C
	Use logic and number facts to solve a problem	Number & Arithmetic	23	B
	Solve a measurement word problem involving different time zones	Measures & Units	28	D
	Solve a complex word problem	Algebra & Patterns	39	90
	Convert between two numeral systems	Number & Arithmetic	34	D
	Identify the net of a cone	Space & Geometry	16	D
	Use a strategy to solve a problem involving proportion	Number & Arithmetic	26	B
	Read analog clocks and calculate elapsed time	Measures & Units	18	A
	Solve a problem using addition and subtraction	Chance & Data	27	B
	Operate with fractions and convert measures of length	Measures & Units	25	C
	Find the number missing from a pattern involving fractions	Algebra & Patterns	22	D
	Calculate capacity using fractions of a whole	Number & Arithmetic	33	C
	Use properties of a rectangle to solve a perimeter problem	Measures & Units	5	B
	Calculate a length by applying a scale to a measurement	Measures & Units	17	C
	Recognise a congruent shape after a quarter turn	Space & Geometry	9	A
	Compare masses to solve a problem involving balance	Measures & Units	30	D
	Solve a word problem involving divisibility by 3	Number & Arithmetic	7	D
	Recognise the piece missing from a pattern	Space & Geometry	29	B
	Use a strategy to find all possible outcomes	Chance & Data	10	C
	Approximate the mass of a cow	Measures & Units	4	C
	Find the product of two squared numbers	Number & Arithmetic	14	D
Easy Questions	Read and interpret data presented in a bar graph	Chance & Data	6	C
	Count the number of pieces of rope after one cut	Space & Geometry	24	D
	Read and interpret a sector graph	Chance & Data	15	A
	Compare volumes of prisms	Measures & Units	13	B
	Recognise the properties of a square-based pyramid	Space & Geometry	12	B
	Add decimals to solve a problem	Number & Arithmetic	11	D
	Use equivalence to solve a number puzzle	Algebra & Patterns	2	B
	Recognise the symmetry of a cone	Space & Geometry	1	C
	Recognise two parallel sides in a shape	Space & Geometry	3	D