UNSW THE UNIVERSITY OF NEW SOUTH WALES SYDNEY • AUSTRALIA EDUCATIONAL ASSESSMENT AUSTRALIA

PAPER D

ICAS

INTERNATIONAL COMPETITIONS AND ASSESSMENTS FOR SCHOOLS

MATHEMATICS

2009

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED.

40 QUESTIONS
TIME ALLOWED: 1 HOUR

STUDENT'S NAME: THUVARAKAN MUTHUKKUMARASAMY (6E)

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.

PLEASE SEE BACK COVER FOR A LIST OF THE YEAR LEVELS THAT SHOULD SIT THIS PAPER

1. This table shows ticket sales for some movies.

Movie Name	Ticket Sales (million $)
Sum It All Up	3.06
The Difference Is Clear	2.39
Divide and Rule	3.56
Square Dancing	5.23
Mathmaticious	4.17
The Fractions	5.26
Tetra Hedron	4.12
The Quadrant	2.62

Which of these movies has the highest ticket sales?

(A) The Fractions
(B) Tetra Hedron
(C) Sum It All Up
(D) Square Dancing

2. Which of these patterns has exactly five lines of symmetry?

(A)

(B)

(C)

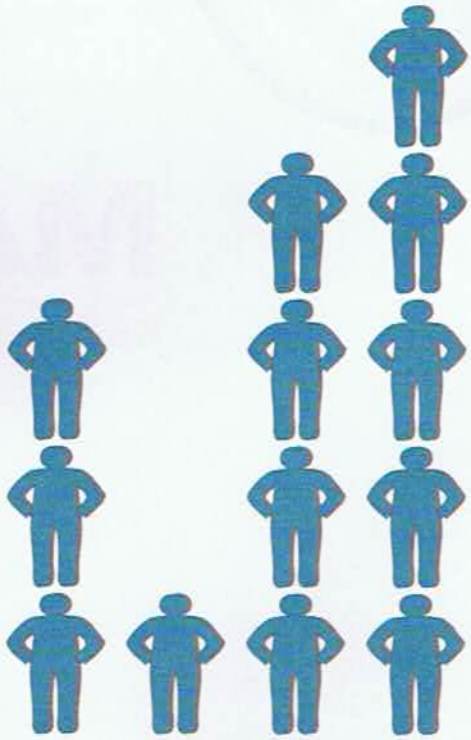
(D)

3. Which pair of symbols makes the number sentence correct?

● – ■ = 48 ÷ 6

(A) ● = 5, ■ = 3
(B) ● = 8, ■ = 4
(C) ● = 17, ■ = 9
(D) ● = 50, ■ = 2

4. Sienna drew a graph to show the sports students in her class play.



Two students play netball.

How many students play hockey?

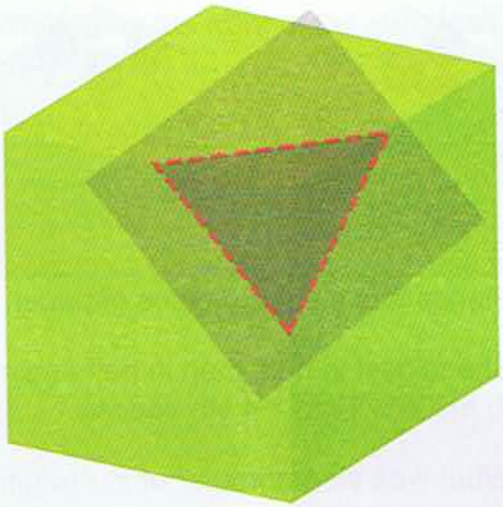
(A) 2
(B) 4
(C) 6
(D) 8

5. The Chen family wants to estimate how much water their household uses each year.

Which of these units would be most suitable?

(A) millilitre
(B) litre
(C) decilitre
(D) kilolitre

6. Jana had a solid cube. She cut off one corner as shown.



Which name describes the corner piece she cut off?

(A) triangular prism
(B) triangular pyramid
(C) square prism
(D) square pyramid

7. How many minutes are there in five and a half hours?

(A) 55
(B) 300
(C) 330
(D) 550

8. What is the missing number in this pattern?

$1\frac{1}{7}, 1\frac{3}{7}, 1\frac{5}{7}, ?, 2\frac{2}{7}, 2\frac{4}{7}$

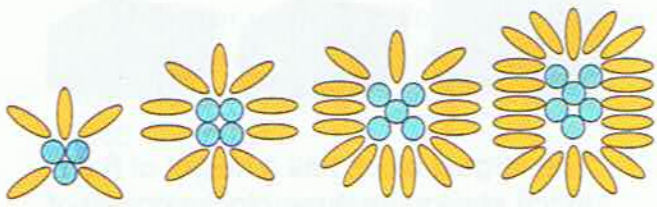
(A) 1
(B) $1\frac{6}{7}$
(C) 2
(D) $2\frac{1}{7}$

9. Eva has three t-shirts and three skirts.

How many different ways can she match a t-shirt and a skirt?

(A) 12
(B) 9
(C) 6
(D) 3

10. Jack made a pattern of shapes out of ovals ⬭ and circles ○.



Jack continued the pattern until he had a shape which used 10 circles.

How many ovals should that shape have?

(A) 25
(B) 35
(C) 40
(D) 50

11. Chris bought 5 identical packets of biscuits. She opened one packet and ate 3 biscuits. She then had 82 biscuits left.

Which expression shows how to work out the number of biscuits in a complete packet?

(A) $(82 + 3) \div 5$
(B) $(82 - 3) \div 5$
(C) $82 + 3 \div 5$
(D) $82 - 3 \div 5$

12. Douglas, Ming and Omar each has a bag of marbles.

Ming has 3 less marbles than Douglas.

Omar has 12 less marbles than Douglas.

Which statement is true?

(A) Ming has 15 more marbles than Omar.
(B) Omar has 15 more marbles than Ming.
(C) Omar has 9 more marbles than Ming.
(D) Ming has 9 more marbles than Omar.

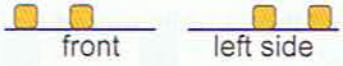
13. Mitch has these three blocks.

The largest block has a height of 6 cm. Mitch stacks the three blocks on top of each other.

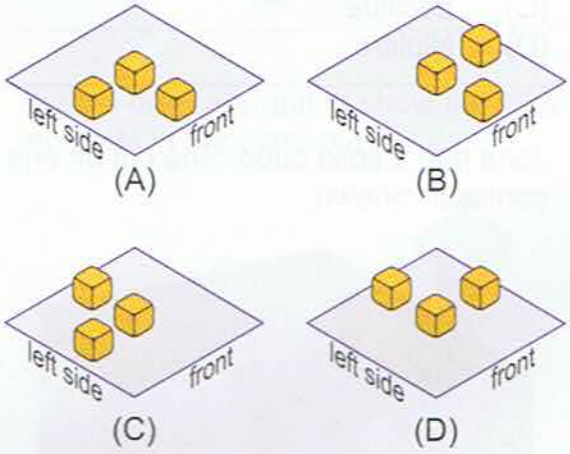
How tall is the stack of three blocks?

(A) 9 cm
(B) 12 cm
(C) 16 cm
(D) 18 cm

14. Jason arranged three blocks on a square. He drew a view from the front and a view from the left side.



Which picture shows how Jason arranged the blocks?



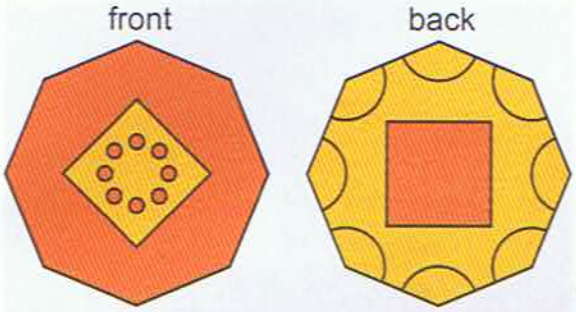
15. Bianca has a square piece of paper.

She folds it in half, then in half again to make a 4 cm × 4 cm square.

What was the perimeter of her original piece of paper?

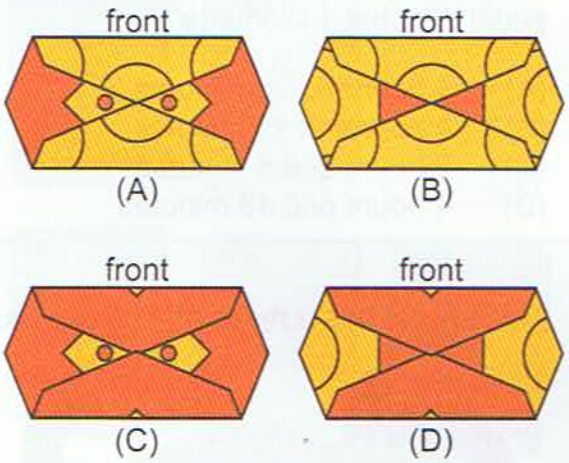
(A) 64 cm
(B) 32 cm
(C) 16 cm
(D) 8 cm

16. Ali has a card with different designs on its front and back.



Ali folds the top corner into the centre of the front and does the same with the bottom corner.

What does the front of the card look like after Ali folds it?



17. Bruno had 12 apples and 18 pears.

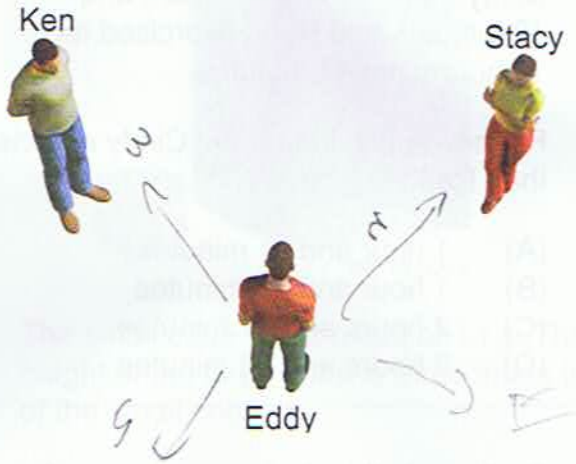
The apples were shared equally into some bags. The pears were shared equally into the same bags. No fruit was left over.

What was the smallest number of apples and pears that he could have put in each bag?

(A) 2 apples and 3 pears
(B) 3 apples and 2 pears
(C) 3 apples and 6 pears
(D) 6 apples and 9 pears

18. Stacy is standing north of Eddy.

Ken is standing west of Eddy.



In which direction should Ken walk to reach Stacy?

(A) SW
(B) SE
(C) NW
(D) NE

19. Matt and Jade used this game board and a die numbered one to six.

3.95	5.16	6.28
5.70	2.53	3.18
2.84	4.90	4.23

Each player rolled the die onto the game board. The number that the die landed on was multiplied by the number on the top face of the die.

If the product was greater than 25, the player coloured the number.

Which number has been **incorrectly** coloured?

(A) 3.18
(B) 4.90
(C) 5.16
(D) 5.70

20. Cindy and Rand recorded the amount of exercise they did in one week.

Cindy exercised for 14 hours and 12 minutes and Rand exercised for 12 hours and 41 minutes.

For how much longer did Cindy exercise than Rand?

(A) 1 hour and 11 minutes
(B) 1 hour and 31 minutes
(C) 2 hours and 31 minutes
(D) 2 hours and 53 minutes

21. Brett made this design on a computer.

He then rotated the design. After the rotation it looked exactly the same.

How many degrees would Brett have rotated the shape?

(A) 180°
(B) 120°
(C) 90°
(D) 60°

22. How many numbers between 1 and 99 contain the digit 3 at least once?

(A) 10
(B) 18
(C) 19
(D) 20

23. This picture shows a boat that moves by turning pedals.

To move forward 1 metre the pedals need to make 6 full turns. The boy in the boat is turning the pedals at a rate of 48 turns every minute.

At this rate how long will it take him to pedal the boat 1 kilometre?

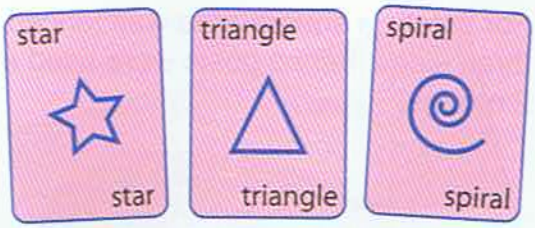
(A) 1 hour and 20 minutes
(B) 1 hour and 25 minutes
(C) 2 hours and 5 minutes
(D) 4 hours and 48 minutes

24. This toy cat has a mass of 41.5 grams.

What is the mass of this cat in **kilograms**?

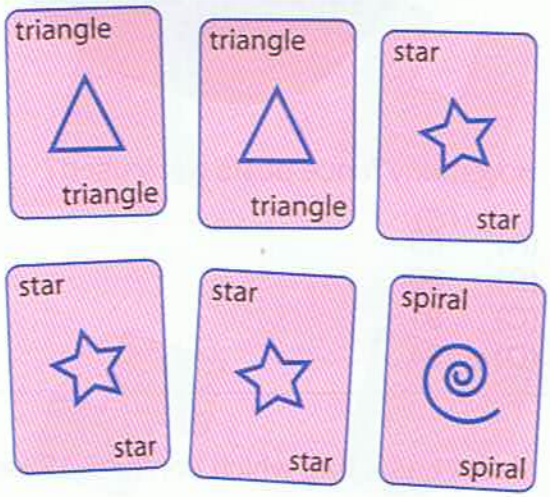
(A) 0.00415
(B) 0.0415
(C) 0.415
(D) 4.15

25. Josh is playing a game that has three types of cards.



The triangle card is worth three times as many points as the star card. The spiral card is worth three times as many points as the triangle card.

These six cards are worth a total of 90 points.



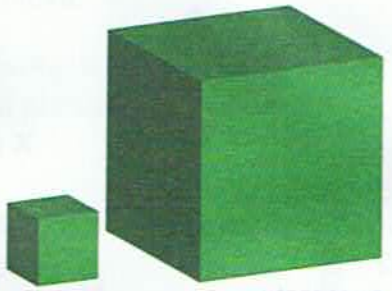
How many points is one spiral card worth?

(A) 5
(B) 15
(C) 30
(D) 45

26. How many multiples of 21 are there between 200 and 400?

(A) 9
(B) 10
(C) 11
(D) 12

27. Ivan has two cubes made of the same substance.

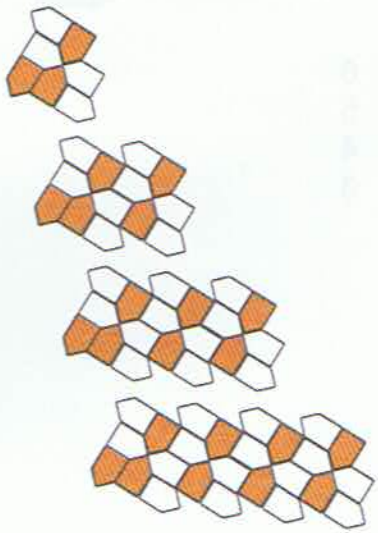


The small cube has a mass of 13 g. The height of the large cube is three times that of the small cube.

What is the mass of the large cube?

(A) 27 g
(B) 39 g
(C) 117 g
(D) 351 g

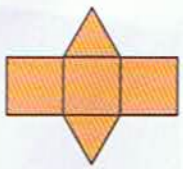
28. Each shape in this pattern uses orange and white tiles.



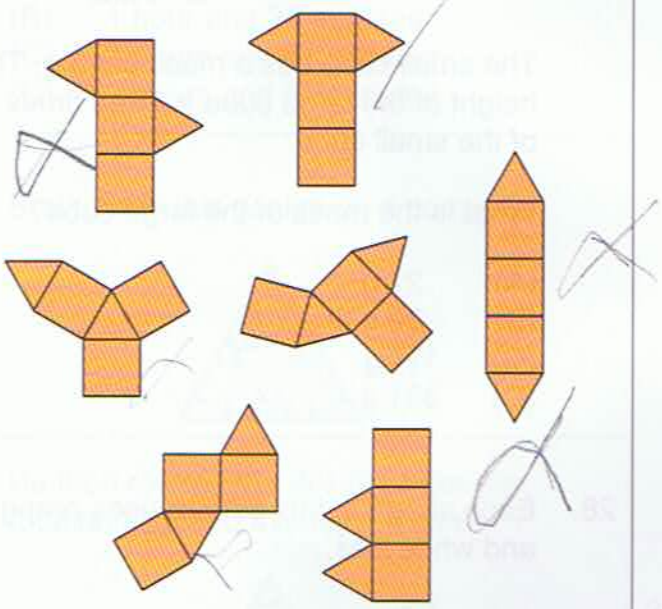
Which rule gives the number of white tiles in relation to the number of orange tiles?

(A) 2 × (orange tiles – 1)
(B) orange tiles – 1 × 2
(C) 2 × orange tiles – 1
(D) (orange tiles × 2) – 1

29. Jose drew this net of a solid with five faces.



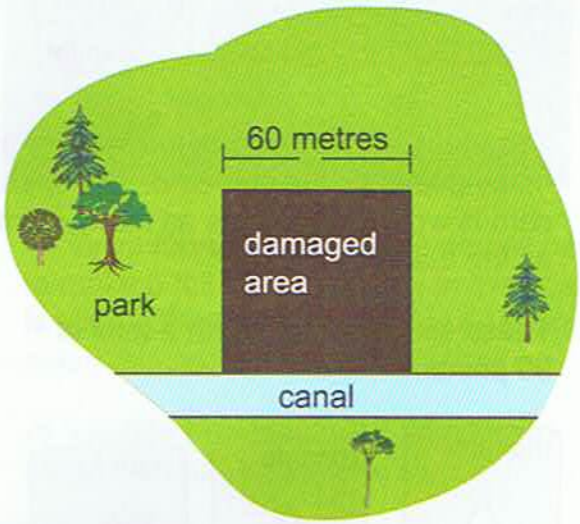
How many of these are nets of the same solid?



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

30. A section of the park near the canal was damaged in a storm.

For safety, a square area was fenced on three sides. Fence posts were used every 2 metres.

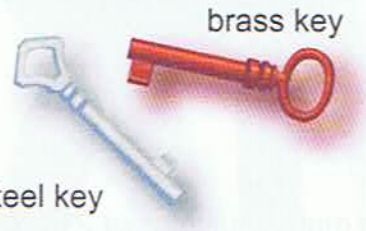


How many fence posts were used?

(A) 89
(B) 90
(C) 91
(D) 94

31. Mabel has a bag which contains 12 keys.

There are two types of keys in the bag, steel and brass.

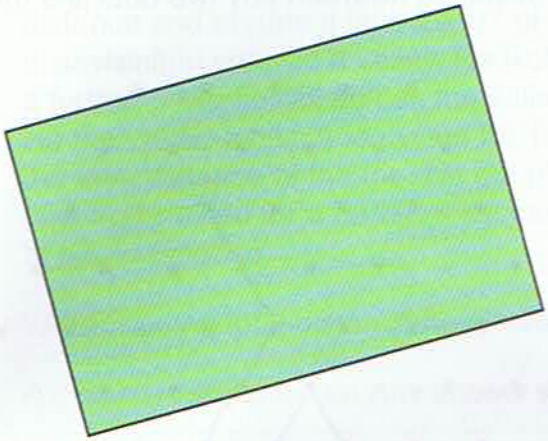


Mabel has a 1 in 3 chance of drawing out a brass key.

How many steel keys are there in the bag?

(A) 3
(B) 4
(C) 8
(D) 9

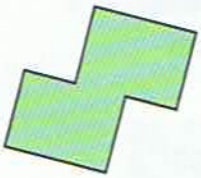
32. Yasmeen wants to cut this rectangle into identical pieces, with no bits left over.



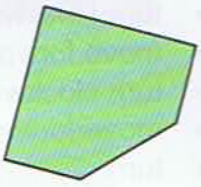
Which shape can the pieces be?

(A)

(B)



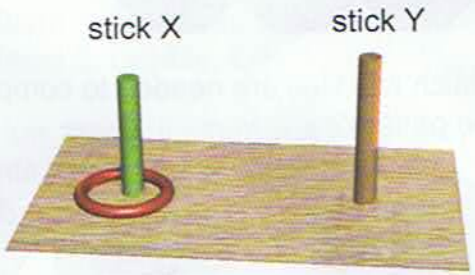
(C)



(D)

33. Nina and Walid played a game. To score points they had to throw hoops around the sticks.

Throwing a hoop around stick Y scores more points than throwing a hoop around stick X.

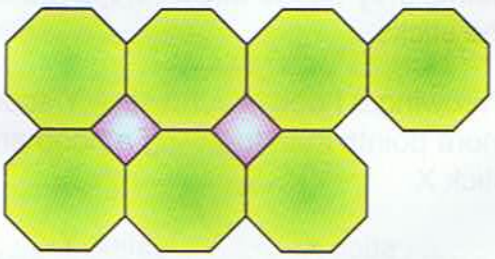


Nina scored 14 points by throwing 3 hoops around stick X and 1 hoop around stick Y. Walid scored 16 points by throwing 2 hoops around each stick.

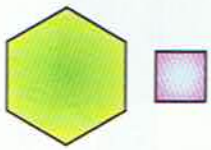
How many points are scored for throwing a hoop around stick Y?

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

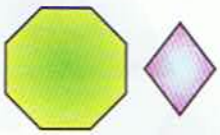
34. This pattern is made out of tiles.



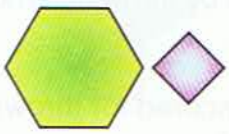
Which two tiles are needed to complete the pattern?



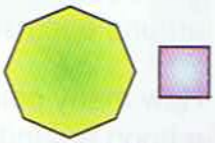
(A)



(B)



(C)



(D)

35. Sam and Kevin are bricklayers.

Sam lays 150 bricks in 60 minutes.
Kevin lays 20 bricks in 10 minutes.

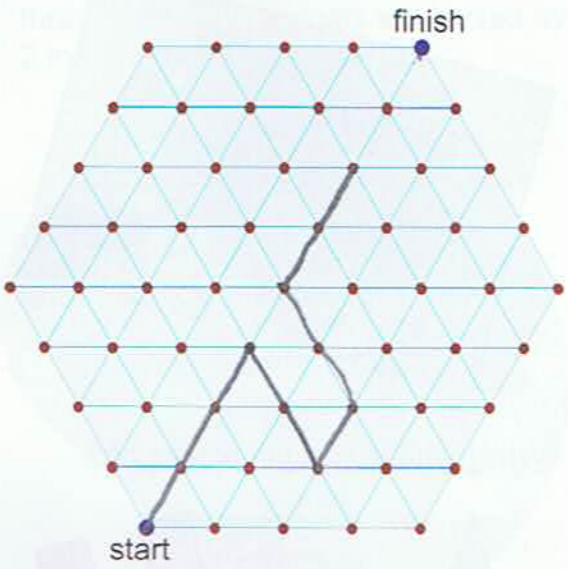
Working together, how many minutes will it take Sam and Kevin to lay 180 bricks?

(A) 25 (B) 40

(C) 70 (D) 100

QUESTIONS 36 TO 40 ARE FREE RESPONSE.

36. Ellen is playing a game on this board. The distance between any two dots is 9 mm.



Ellen moves her piece using these directions:

- place piece on 'start' pointing towards the finish
- move forward 27 mm
- turn clockwise 120°
- move forward 18 mm
- turn clockwise 240°
- move forward 9 mm
- turn anticlockwise 60°
- move forward 18 mm
- turn clockwise 60°
- move forward 18 mm

What is the shortest distance in millimetres that Ellen's piece will now have to travel by moving between the dots to get to the finish?

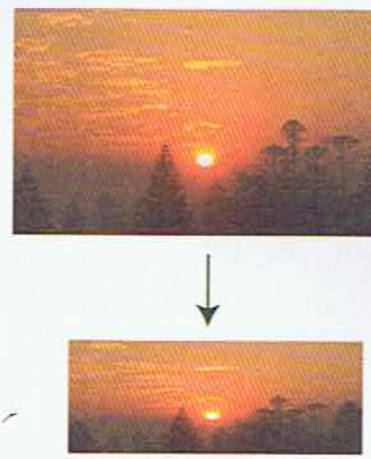
(Write only the number on your answer sheet.)

37. Adam went on a long trip. For 1/6 of the distance he walked beside a river. He then walked over a bridge for 1/12 of the distance and around a lake for 1/7 of the distance and entered a valley. He walked a further 5 kilometres across the valley. He then hired a bike and cycled for 1/2 of the total distance of the trip. He got off the bike and walked for a further 4 kilometres to his destination.

What was the total distance he covered?

(Write only the number on your answer sheet.)

38. On her computer Rebecca changed a picture so that its height was 50% of its original size and its width was 75% of its original size.



The area of the picture after the change was 146.25 cm^2.

What was the area, in square centimetres, of the picture before the change?

(Write only the number on your answer sheet.)

39. 'Mathsball' is a game played by two teams of three players. Afia, Ben, Clare, Debbie, Eric and Fern put themselves into the two teams.

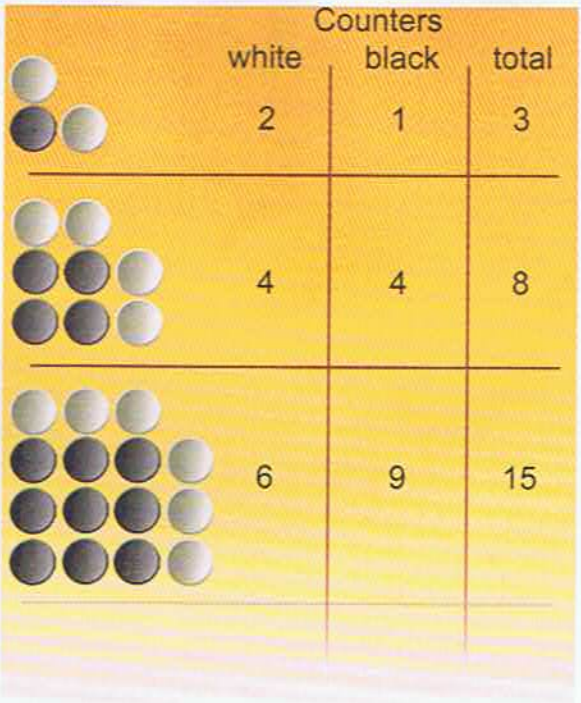
One way they can be put into two teams is this:

Team 1: Afia, Ben, Clare
Team 2: Debbie, Eric, Fern

How many different ways can they be put into two teams of three players?

(Write only the number on your answer sheet.)

40. The diagram shows the start of a pattern made with black and white counters.



How many black counters would be used when the total is 399?

(Write only the number on your answer sheet.)

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AUSTRALIA: Year 6
BRUNEI: Primary 6
INDONESIA: Year 7
MALAYSIA: Standard 6
NEW ZEALAND: Year 7
PACIFIC: Year 6
SINGAPORE: Primary 5
SOUTH AFRICA: Grade 6