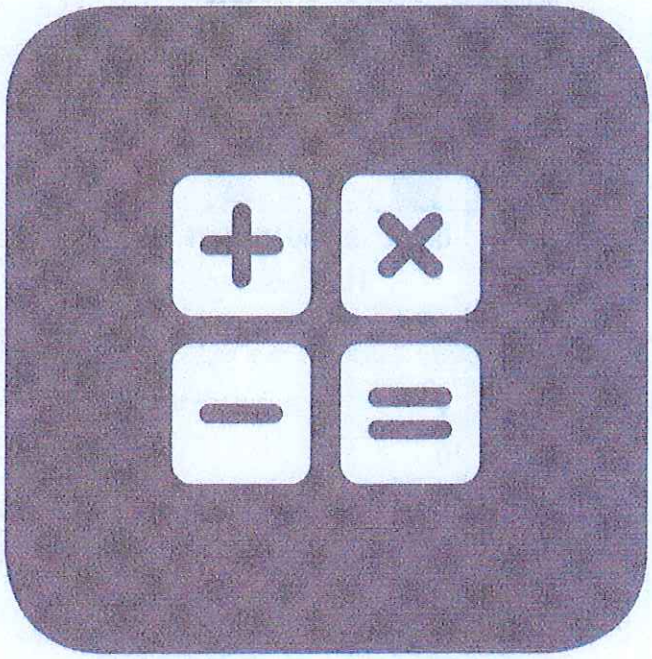
UNSW Global
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

PAPER D



2012 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.

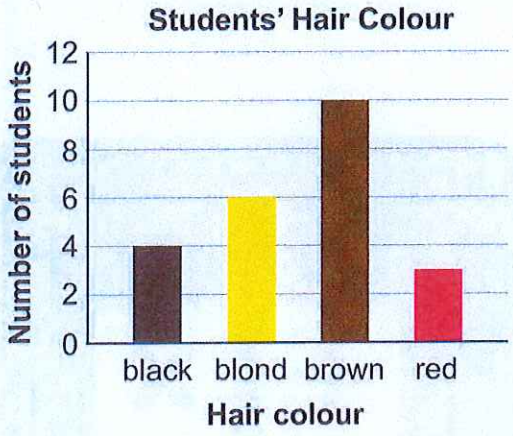
There are **35 MULTIPLE-CHOICE QUESTIONS** (1–35).
Use the information provided to choose the **BEST** answer from the four possible options.
On your **ANSWER SHEET** fill in the oval that matches your answer.

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.

Educational Assessment Australia
eaa.unsw.edu.au

1. Mike grouped all the students in his class by their hair colour. The graph shows the number of students in each group.



How many students are in Mike's class?

(A) 4
(B) 10
(C) 22
(D) 23

2. Joe wants to measure the time it takes to travel to the city by train.

Which of these units should Joe use?

(A) hours
(B) kilometres
(C) kilometres per hour
(D) hours per kilometre

3. The table shows the final scores of four teams in a competition.

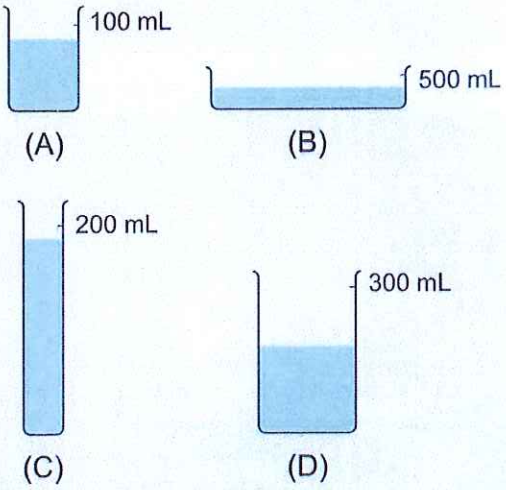
Team	Points
Blue	547
Red	348
Green	469
Yellow	320

How many more points were scored by the team that came first than the team that came third?

(A) 227
(B) 201
(C) 199
(D) 78

4. These containers have water in them.

Which container has the largest volume of water?



5. Sasi bought some fruit.

174 grams

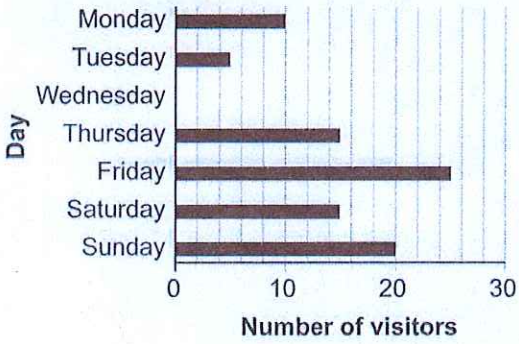
522 grams

386 grams

What is the total mass of Sasi's fruit, in kilograms?

(A) 1.082
(B) 1.82
(C) 10.82
(D) 1082

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. $7^2 + 3^2 =$?

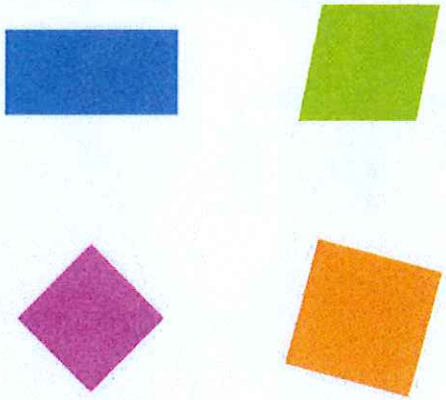
(A) 20
(B) 58
(C) 100
(D) 104

8. There are 40 children in the Happyville School choir. Six of the children are from Mr Ling's class.

What percentage of the choir is **NOT** from Mr Ling's class?

(A) 6%
(B) 15%
(C) 34%
(D) 85%

9. Here are four shapes.

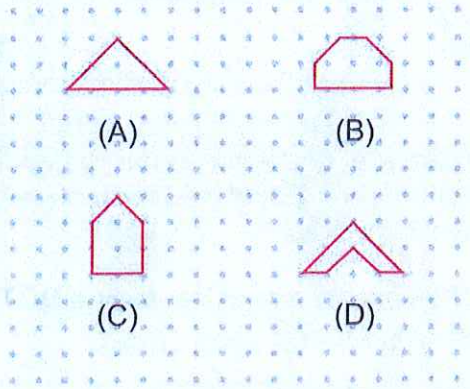


How many of these shapes are squares?

(A) 0
(B) 1
(C) 2
(D) 3

10. Four shapes were drawn on square dot paper.

Which shape has the largest perimeter?

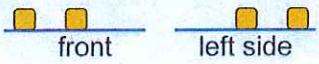


11. Chris bought 5 identical packets of biscuits. She opened one packet and ate 3 biscuits. She then had 82 biscuits left.

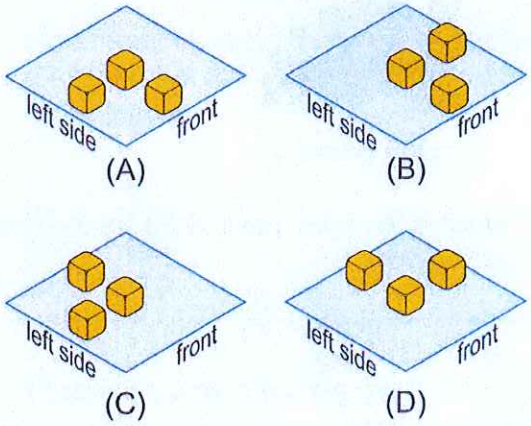
Which expression shows how to work out the number of biscuits in a complete packet?

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

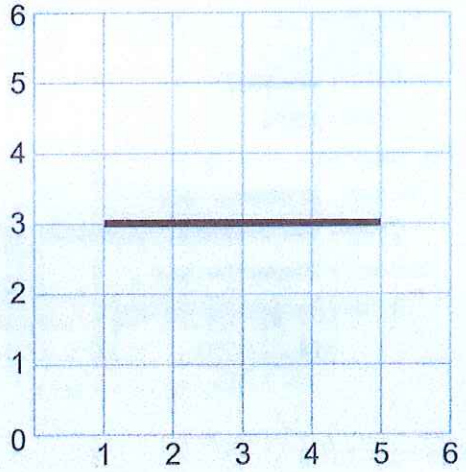
12. Jason arranged three blocks on a square. He drew a view from the front and a view from the left side.



Which picture shows how Jason arranged the blocks?



13. Mike drew a black line on this grid from (1, 3) to (5, 3).



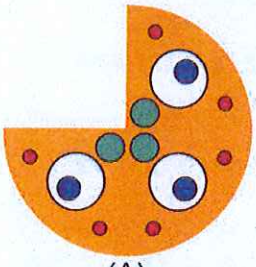
Which of the following pairs of points when joined makes a line which has the same length as Mike's line?

(A) (1, 2) to (4, 2)
(B) (1, 4) to (4, 1)
(C) (2, 0) to (6, 4)
(D) (3, 2) to (3, 6)

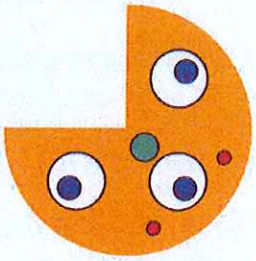
14. This picture shows one quarter of a design.

The design has only two lines of symmetry.

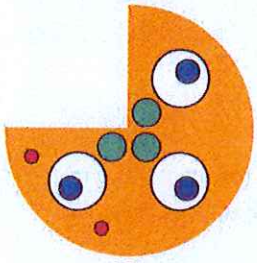
Which of these could be the other three quarters of the design?



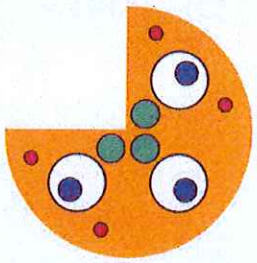
(A)



(B)



(C)



(D)

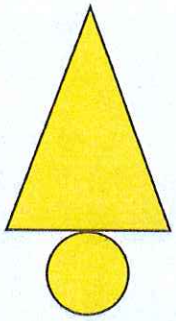
15. Ann has seedlings like the one shown.

She wants to plant the seedlings in 4 rows with the same number of seedlings in each row. Ann will have 3 seedlings left over.

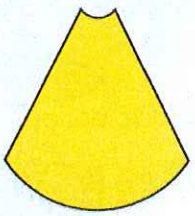
How many seedlings could Ann have?

(A) 12
(B) 13
(C) 16
(D) 19

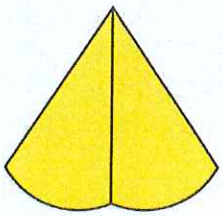
16. Which of these is the net of a cone with no base?



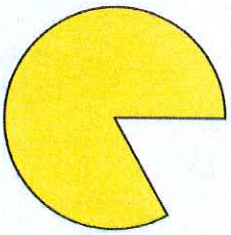
(A)



(B)

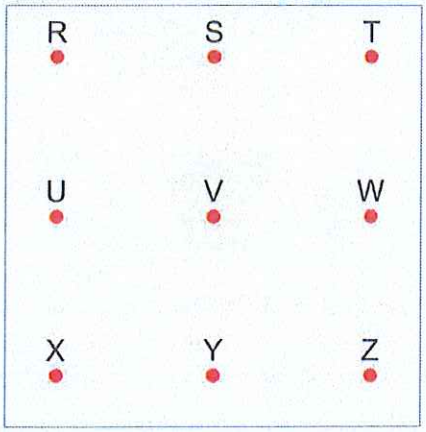


(C)



(D)

17. The points on the square dot paper below are labelled from R to Z.

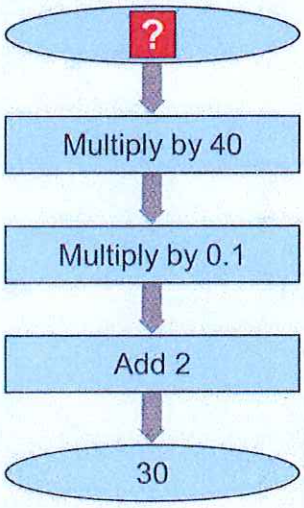


Point X is north of Point T.

Which point is south-east of Point V?

(A) Point R
(B) Point S
(C) Point W
(D) Point Z

18. What number is missing from this chart?



(A) 7
(B) 30
(C) 122
(D) 128

19. Fadi wants to buy some pizzas for his party.

Seafood pizza - $9.50 each

Vegetarian pizza - $6.20 each

Fadi bought 8 seafood pizzas and 12 vegetarian pizzas.

How much did Fadi spend on pizzas?

(A) $15.04
(B) $15.70
(C) $150.40
(D) $163.60

20. Bianca has a square piece of paper.

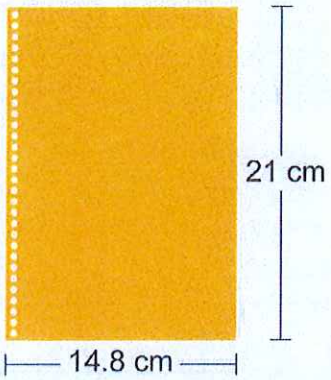
She folds it in half, then in half again to make a 4 cm × 4 cm square.

What was the perimeter of her original piece of paper?

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

21. Ann used a book to measure the area of her desk.

Here is a picture of Ann's book.



She found that the area of her desk is 12 times greater than the area of her book.

Which of the following gives the area of Ann's desk, in cm^2?

(A) $14.8 + 21 + 12$
(B) $14.8 \times 21 \times 12$
(C) $(14.8 + 21) \times 12$
(D) $2 \times (14.8 + 21) \times 12$

22. What is the missing number?

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

(A) $\frac{5}{4}$ (B) $\frac{3}{4}$

(C) $\frac{5}{8}$ (D) $\frac{3}{8}$

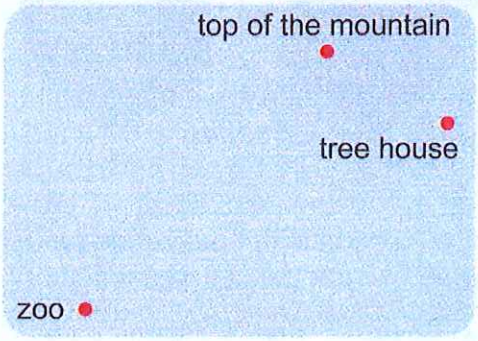
23. Cindy and Rand recorded the amount of exercise they did in one week.

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

24. Based on the map below, the tree house is 5 kilometres from the top of the mountain.



How far is the zoo from the top of the mountain, in kilometres?

(A) 14.5
(B) 12.5
(C) 11
(D) 5

25. $4 \times 9 - 6 \times 3 + 6 = ?$

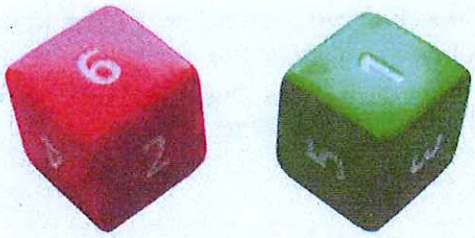
(A) 24
(B) 42
(C) 96
(D) 108

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

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

27. Lin has two dice numbered from 1 to 6. One die is red and the other is green.

Lin rolls the two dice together. One possible outcome is 6 on the red die and 1 on the green die.



red green

How many different outcomes are possible when Lin rolls the two dice together?

(A) 36
(B) 21
(C) 12
(D) 6

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

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

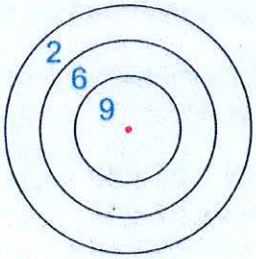
29. Last Monday, the price of gold for one troy ounce was $1 550.

One troy ounce is approximately 31 grams.

What was the approximate price of one kilogram of gold last Monday?

(A) $50 000
(B) $48 050
(C) $5 000
(D) $4 805

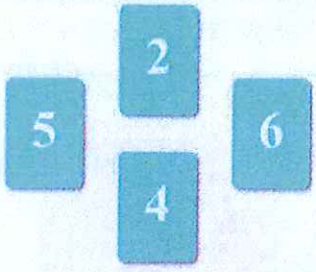
30. On this dart board, a player can only score 2, 6 or 9 points for a throw.



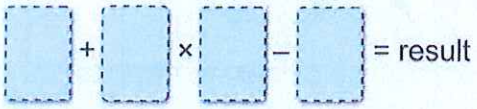
What is the smallest number of throws needed to get a total score of exactly 82 points?

(A) 13
(B) 12
(C) 11
(D) 10

31. Ann has four number cards.



She arranges the cards into this number sentence to give the largest possible result.



Which of these is the result?

(A) 32
(B) 42
(C) 48
(D) 52

32. Which card should be removed so the remaining cards make a pattern?

(A) (B) (C) (D)

33. Sasi has 5 white boxes and 2 black boxes.

Each white box contains 2 red marbles and 8 green marbles.

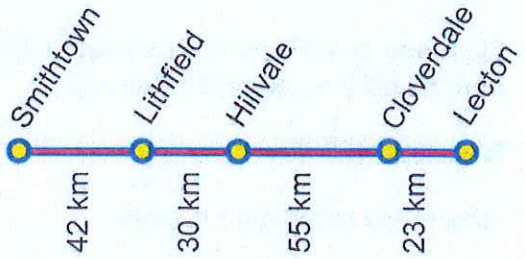
Each black box contains 1 red marble and 10 green marbles.

Without looking, Sasi takes a marble from one of the boxes.

Which one of these is Sasi most likely to take?

(A) a red marble from a white box
(B) a red marble from a black box
(C) a green marble from a white box
(D) a green marble from a black box

34. Joe travelled from Smithtown to Lecton without stopping. He left Smithtown at 9:00 am and arrived in Lecton at 11:15 am. Joe passed through several towns on the way. The diagram shows the distances between them.



This table shows the time at which Joe passed through each town.

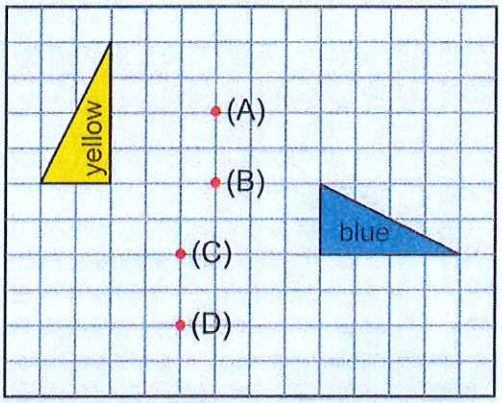
Town passed	Time
Lithfield	9:40 am
Hillvale	10:05 am
Cloverdale	10:55 am

Between which two towns did Joe travel at the highest average speed?

(A) Smithtown and Lithfield
(B) Lithfield and Hillvale
(C) Hillvale and Cloverdale
(D) Cloverdale and Lecton

35. Mike wants to rotate the yellow triangle around a point so that it exactly covers the blue triangle.

Around which point on the square grid must Mike rotate the yellow triangle?



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.

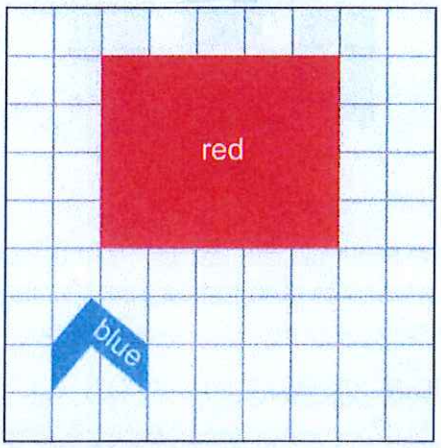
36. Lin sells flowers.

Lin made some bunches of flowers. Each bunch had 3 roses and 4 daisies.

She used 168 flowers altogether.

How many roses did Lin use?

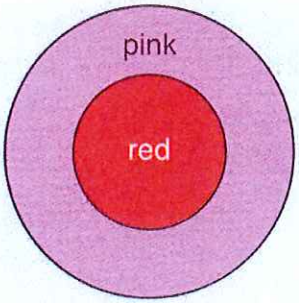
37. This grid is taken from an alien planet. On this planet, the unit used to measure area is called zetrad.



The blue shape has an area of 1 zetrad.

What is the area of the red shape, in zetrads?

38. 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.

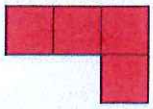
Mike shot 3 arrows into the red section and 1 arrow into the pink section. His score was 170.

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

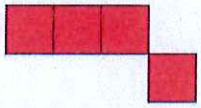
What was Joe's score?

39. A tetromino is a shape made of 4 squares of equal size. Each of the squares must have a common side with at least one other square.

This is a tetromino.



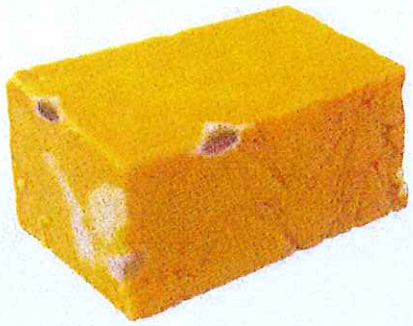
This is NOT a tetromino.



Two tetrominoes are the same if one is a reflection and/or rotation of the other.

How many different tetrominoes can be drawn?

40. Joe bought a 1 kilogram block of cheese that was 12 cm × 10 cm × 8 cm.



When he needed to use it, he found mould on each face of the block. To remove the mould, Joe cut a 1 cm thick slice from each face.

What was the mass of the remaining block of cheese, in grams?