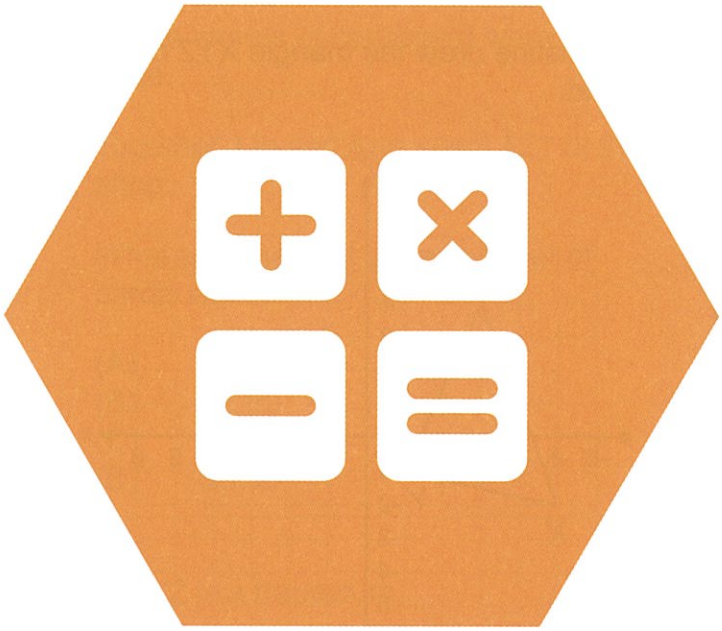
UNSW Global
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

# PAPER F



# 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.
A **CALCULATOR** is required.

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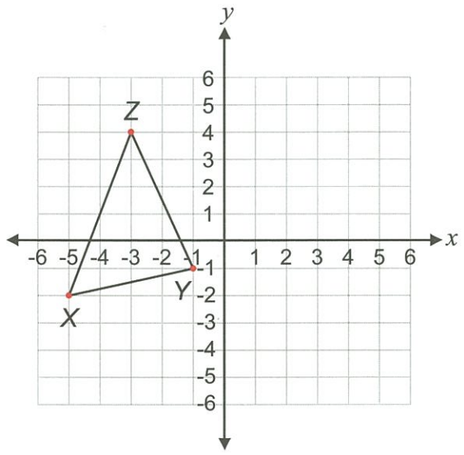
1. What is 17.1046 rounded to the nearest hundredth?

(A) 17.10
(B) 17.11
(C) 17.104
(D) 17.105

2. Christine drew the triangle *XYZ* on this grid.




What are the coordinates of the vertices of the triangle Christine drew?

| | *X* | *Y* | *Z* |
|---|---|---|---|
| (A) | (-5,-2) | (-1,-1) | (-3,4) |
| (B) | (-5,2) | (1,-1) | (-3,4) |
| (C) | (-5,-2) | (1,-1) | (3,4) |
| (D) | (-2,-5) | (-1,-1) | (4,-3) |

3. A family consumes 12 tubs of butter in a year. Each tub holds 750 g of butter. The butter contains 1.5% salt.


About how much salt, in grams, is in the butter consumed by the family in one year?

(A) 11
(B) 18
(C) 135
(D) 1350

4. The ratio of cars to motorbikes in a car park is 10 cars to 4 motorbikes.

There are 70 motorbikes in the car park.

How many cars are there?

(A) 25
(B) 28
(C) 50
(D) 175

5. 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

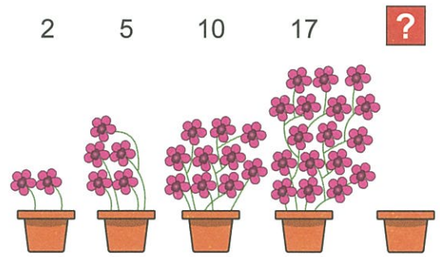


6. What is the solution for this equation?

$$5x + 9 = 3(x + 3)$$

(A) -3
(B) 0
(C) 6
(D) 9

7. Jack placed flowers in some pots according to a pattern.




How many flowers must Jack place in the empty pot to complete the pattern?

(A) 20
(B) 24
(C) 26
(D) 27

8. Lin and Ann went to the local shop to buy stationery for their projects.

Lin bought two sheets of cardboard and spent $6.50 on pencils.

Ann bought three sheets of cardboard and spent $4.50 on stickers.

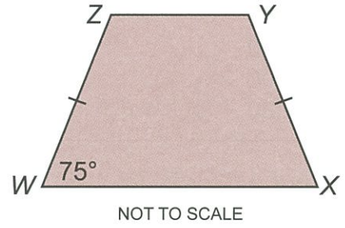
All the sheets of cardboard were the same price.

Together, Lin and Ann spent $21 at the shop.

What was the cost of each sheet of cardboard?

(A) $2.00
(B) $2.20
(C) $4.20
(D) $5.00

9. *WXYZ* is a trapezium.




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° |



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10. The table shows a city's maximum daily temperatures for one week.

| Mon | Tues | Wed | Thur | Fri | Sat | Sun |
|---|---|---|---|---|---|---|
| 6 °C | 11 °C | 7 °C | 13 °C | 10 °C | 5 °C | 11 °C |

What is the median of the temperatures in the table?

(A) 9 °C
(B) 10 °C
(C) 11 °C
(D) 13 °C

11. Jim lives in Auckland and his friend Noor lives in Bangalore.

The time in Bangalore is seven-and-a-half hours behind the time in Auckland.

At 2:30 pm in Auckland, Jim phoned Noor.

What time was it in Bangalore (using 24-hour time) when Jim phoned Noor?

(A) 07:00
(B) 07:30
(C) 22:00
(D) 22:30

12. Meg drew this parallelogram.


What is the value of $x$?

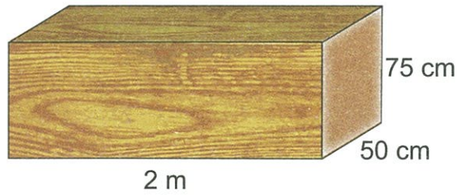
(A) 64
(B) 116
(C) 128
(D) 154

13. 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

14. Angela has a piece of wood that she plans to paint blue all over.




The paint tin she has chosen states the contents are enough to paint 2 m² of wood.

How many tins of this paint must Angela buy to paint the wood?

(A) 6
(B) 4
(C) 3
(D) 1



15. When an appliance with a power rating of 1 kilowatt is turned on for one hour, the energy used is 1 kilowatt-hour.

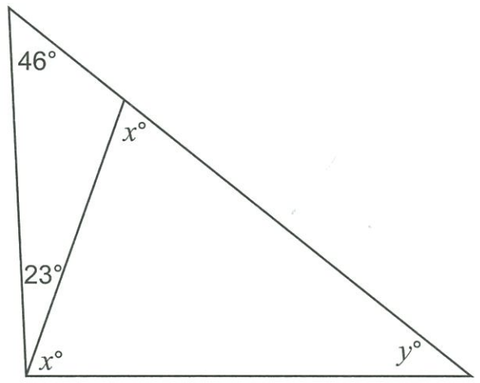
Sue has 3 computers in her office. Each computer has a monitor. Each computer has a rating of 0.11 kilowatts. Each monitor has a rating of 0.08 kilowatts.

Paul has an office with 3 laptops. Each laptop has a rating of 0.04 kilowatts.

How much less energy do Paul's laptops use, in an eight-hour day, than Sue's computers and monitors?

(A) 0.45 kilowatt-hours
(B) 1.68 kilowatt-hours
(C) 3.60 kilowatt-hours
(D) 4.44 kilowatt-hours

16. What is the value of $y$?




NOT TO SCALE

(A) 23
(B) 42
(C) 46
(D) 69

17. 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%

18. The distance, $s$, travelled by a car is given by the formula

$$s = ut + \frac{1}{2}at^2$$

where $u$ = initial speed, $t$ = time and $a$ = acceleration.

A car has an initial speed of 4 m/s and travels with an acceleration of 3 m/s².

What is the distance travelled by the car in 10 seconds?

(A) 340 m
(B) 190 m
(C) 70 m
(D) 55 m



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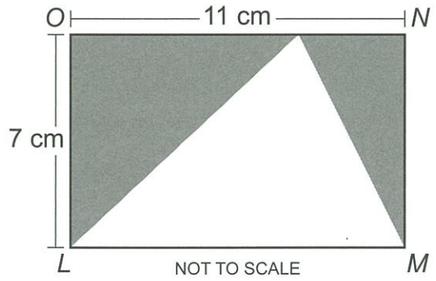
19. *LMNO* is a rectangle.




What is the area of the shaded part, in cm²?

(A) 77 (B) $51\frac{2}{3}$

(C) $38\frac{1}{2}$ (D) 36

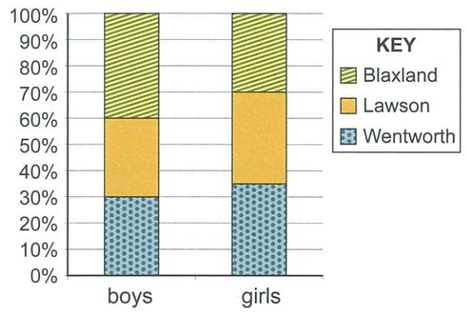
20. Which fraction is equivalent to $\frac{a}{b}$ ?

(A) $\frac{a+b}{b+b}$ (B) $\frac{a+1}{b+1}$

(C) $\frac{a^2}{b^2}$ (D) $\frac{a+a}{b+b}$

21. 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.

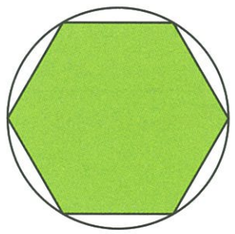



How many more boys than girls are there in Blaxland house?

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

22. A regular hexagon fits inside a circle of diameter 6 cm.

Each vertex of the hexagon touches the circumference of the circle.

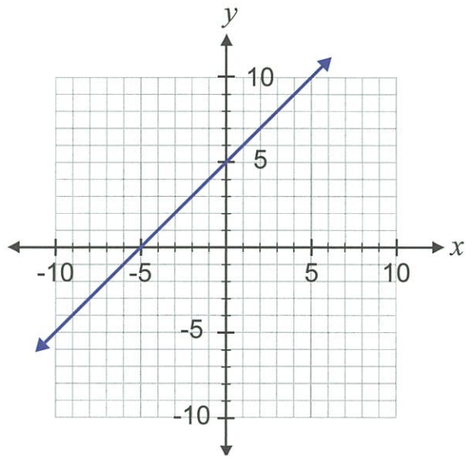


What is the perimeter of the hexagon?

(A) 18 cm
(B) 19 cm
(C) 27 cm
(D) 36 cm



23. Joshua drew this graph using a table of values from his textbook.




Which of these could be the table of values from his textbook?

(A)

| $x$ | -2 | -1 | 0 | 1 | 2 |
|---|---|---|---|---|---|
| $y$ | 3 | 4 | 5 | 6 | 7 |

(B)

| $x$ | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|
| $y$ | -2 | -1 | 0 | 1 | 2 |

(C)

| $x$ | -2 | -1 | 5 | 6 | 7 |
|---|---|---|---|---|---|
| $y$ | 3 | 4 | 0 | 1 | 2 |

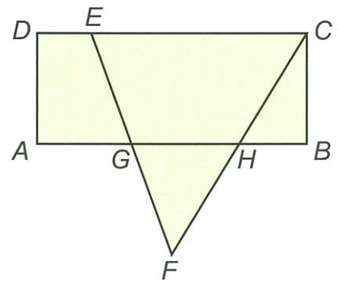
(D)

| $x$ | 3 | 4 | 0 | 1 | 2 |
|---|---|---|---|---|---|
| $y$ | -2 | -1 | 5 | 6 | 7 |

24. *ABCD* is a rectangle.

*EF* and *CF* are straight lines intersecting *AB* at *G* and *H* respectively.

$\angle HCB = 40°$ and $\angle AGE = 75°$




What is the size of $\angle EFC$?

(A) 35°
(B) 55°
(C) 65°
(D) 75°

25. Andrew wrote down his five favourite numbers. The mean of Andrew's numbers is 17.

Four of the numbers are 9, 13, 14 and 21.

What is Andrew's fifth number?

(A) 15
(B) 17
(C) 19
(D) 28



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26. 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

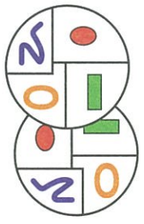
(C) $\frac{2}{3}$

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

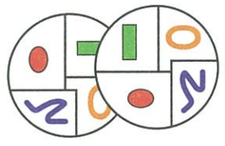
27. Yara created a picture on her computer.


To create a design, she made a copy of the picture and rotated the copy 90° anticlockwise about the point *P*.

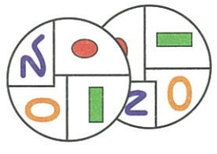
Which of the following was her design?



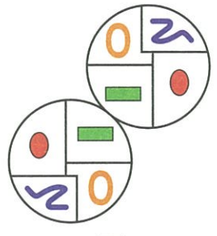
(A)



(B)



(C)



(D)

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

Figure A

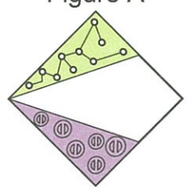
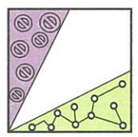


Figure B



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

29. A cafe sells different types of burgers.

A customer can choose a vegetarian, a lamb or a chicken burger.

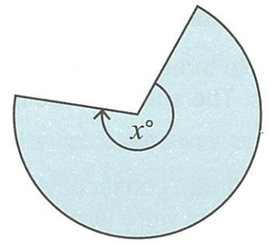
The burgers can be grilled or fried and have either tomato or sweet chilli sauce.

How many different types of burgers does the cafe sell?

(A) 5
(B) 6
(C) 7
(D) 12



30. This diagram represents the sector of a circle with a radius of 5 cm.




NOT TO SCALE

The perimeter of this shape is 25 cm.

Which of these is closest to the value of $x$?

(A) 17
(B) 29
(C) 172
(D) 287

31. Adam's height is $\frac{6}{7}$ of Sunil's height.

Noor's height is $\frac{14}{15}$ of Sunil's height.

Which of the following calculations gives Adam's height as a fraction of Noor's height?

(A) $(6 \times 15) \div (7 \times 14)$
(B) $(6 \times 14) \div (7 \times 15)$
(C) $(7 \times 14) \div (6 \times 15)$
(D) $(7 \times 15) \div (6 \times 14)$

32. Sixty people came to Marco's party. They were dressed in red, green or white.

The ratio of people dressed in red to people dressed in green was 2:3.

The number of people dressed in white was half the number of people dressed in red.

How many people were dressed in red?

(A) 10
(B) 20
(C) 30
(D) 40

33. $2\frac{1}{3} + 5\frac{1}{3} \times \Delta = 25$

What is the value of the symbol $\Delta$?

(A) $\frac{9}{8}$ (B) $\frac{18}{17}$

(C) $\frac{17}{4}$ (D) $\frac{75}{23}$



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34. Jake, Tim and Shadia are standing in a field. Each person is 6 metres away from anyone else.

Uma arrives and stands 6 metres away from both Shadia and Tim but at a greater distance from Jake.

Jake is facing Tim. Jake then turns to face Uma.

How many degrees did Jake turn?

(A) 15°
(B) 30°
(C) 60°
(D) 90°

35. The square numbers are the squares of positive whole numbers, i.e. 1, 4, 9, 16, …

How many square numbers less than 1 000 000 are divisible by 6?

(A) 166 666
(B) 27 777
(C) 166
(D) 27

**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.**

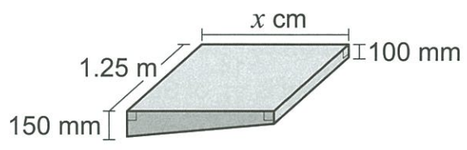
36. Alice wrote three consecutive even numbers. The sum of these numbers was 252.

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?

37. Max poured a concrete slab as the foundation for his new garden shed. This is the shape of his concrete slab.




NOT TO SCALE

His concrete slab had a total mass of 920 kg.

The mass of one cubic centimetre of concrete is 2.3 g.

What is the value of $x$?



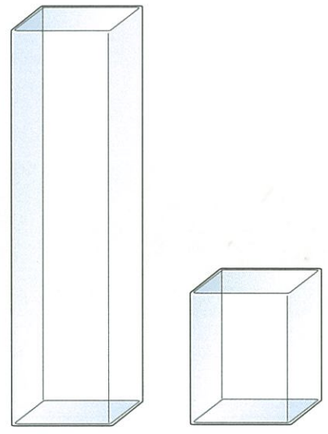
38. On Wednesday all items at a clothing store were $15. Bernadette bought a number of items.

On Thursday all items after the first three were 10% off.

Bernadette calculated that on Thursday she could have bought an extra two items with the same amount of money as she had spent on Wednesday.

How many items did Bernadette buy on Wednesday?

39. Sandra had short and tall glasses in the shape of square prisms. The short glasses were one-third the height of the tall glasses. All the glasses had the same sized square bases.



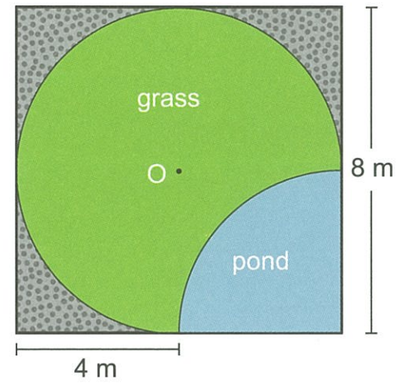
Sandra had twice as many short glasses as tall glasses. Sandra completely filled all the glasses she had. She used a total of 1600 mL of fruit juice.

What was the total amount of juice, in mL, in the short glasses?

40. This is the plan of Jillian's square garden. All the curved lines in the plan are parts of circles. The pond is a quarter circle.

The centre of the garden is at O.

Plan of Garden




What is the area of the grass, to the nearest m²?



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

| Question Number | Paper F |
|---|---|
| 31 | A |
| 32 | B |
| 33 | C |
| 34 | B |
| 35 | C |
| 36 | 327 |
| 37 | 256 |
| 38 | 21\|021 |
| 39 | 640 |
| 40 | 41\|041 |

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