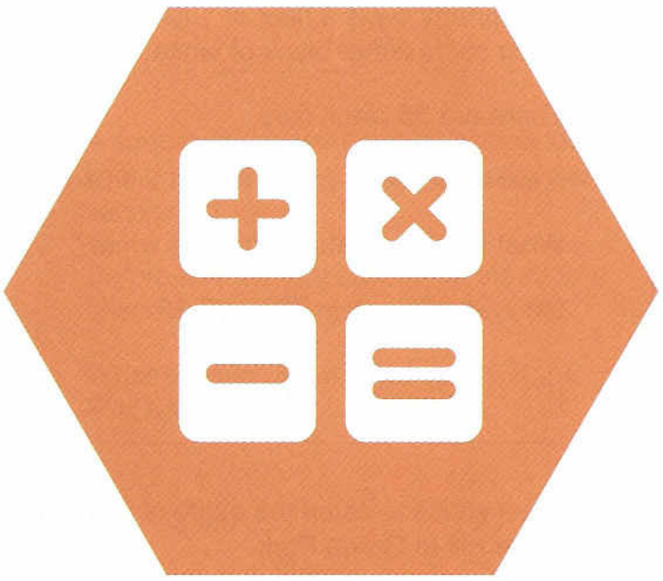
UNSW Global
AUSTRALIA

PAPER F



2015 ICAS

International Competitions and Assessments for Schools

MATHEMATICS

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**.

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 84 rounded to the nearest ten?

(A) 100
(B) 90
(C) 85
(D) 80

2. A company owns a fleet of 100 cars. Each car is either black or white.

There are 35 black cars.

A car is picked at random from the fleet.

What is the probability that it is white?

(A) 0.35 (B) 0.65

(C) $\frac{1}{35}$ (D) $\frac{1}{65}$

3. Priya wants to catch the express bus from Rose Hill to Green Park.

	All stops	Express
Fairy Wood	7:27	7:44
Rose Hill	7:34	7:51
High Street	7:46	8:03
Surrey Street	7:52	
Victoria Road	7:58	
Green Park	8:11	8:16
Merry Meadows	8:24	8:29

How long will this journey take?

(A) 37 minutes
(B) 35 minutes
(C) 32 minutes
(D) 25 minutes

4. Tala wants to sell a comic book that she bought new for $12.

The table shows the value of used comic books based on their condition.

Condition	Percentage of new value
Excellent	90%
Good	85%
Fair	50%
Poor	35%

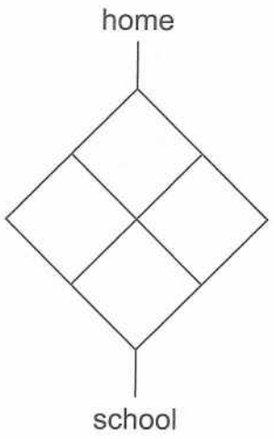
Tala's comic book is in good condition.

How much is the comic book worth?

(A) $6.00 (B) $8.50
(C) $9.00 (D) $10.20

5. Mike walks from his home to his school.

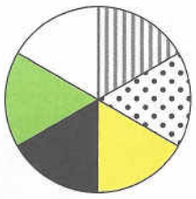
There are a number of paths he can take, but he always walks in a direction that will take him closer to his school.



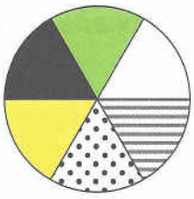
How many different paths can Mike take to get to his school?

(A) 8
(B) 6
(C) 3
(D) 2

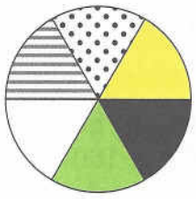
6. Edward turns this wheel a quarter turn anticlockwise. Then Mia turns it a further half turn in the same direction.



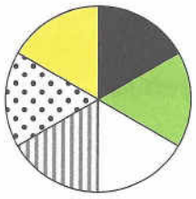
Which option shows the wheel after these turns?



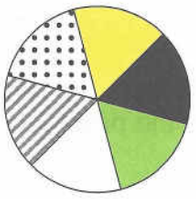
(A)



(B)



(C)



(D)

7. A bus left the city. At the first stop, 6 people got off and 4 people got on the bus.

At the second stop, 5 people got off and 11 people got on the bus.

At the third stop, 15 people got off. There were 34 people left on the bus.

How many people were on the bus when it left the city?

(A) 23 (B) 45
(C) 57 (D) 75

8. A game of basketball started at 6.15 pm and finished at 7.07 pm.

All breaks between the 10-minute quarters were the same length.

How long was each break, in minutes?

(A) 2 (B) 3
(C) 4 (D) 6

9. A spaceship enters Earth's atmosphere with an initial speed of 1150 metres per second.

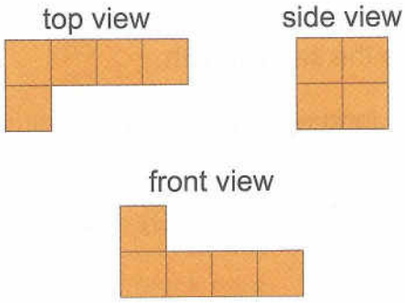
Before it lands, the spaceship slows to a final speed of 1.5 metres per second.

What fraction of the initial speed is the final speed?

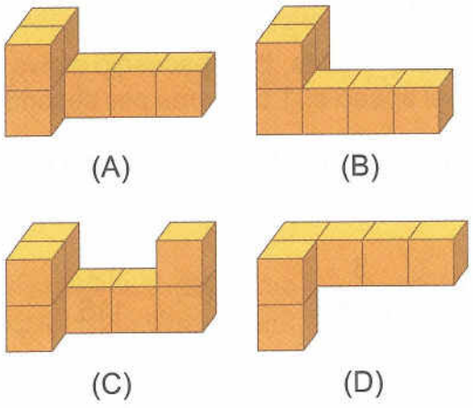
(A) $\frac{3}{2300}$ (B) $\frac{15}{115}$

(C) $\frac{115}{15}$ (D) $\frac{2300}{3}$

10. Krish used cubes to build a solid matching these three views.



Which of these could be Krish's solid?



11. Sarah started with a number.

She multiplied it by 3 and then added 6. Her answer was 30.

Yumi started with the same number as Sarah.

She halved it and then added 20.

What was Yumi's answer?

(A) 35
(B) 28
(C) 24
(D) 23

12. Mary had 600 grams of jelly beans in a box.

She filled 3 identical jars with these jelly beans. There were 360 grams of jelly beans left in the box.

How many grams of jelly beans were in each jar?

(A) 80 (B) 120
(C) 160 (D) 200

13. The longest side of a rectangular prism is 10 cm. The shortest side is 6 cm.

Which of the following could be the volume of the prism?

(A) 60 cm^3
(B) 120 cm^3
(C) 480 cm^3
(D) 720 cm^3

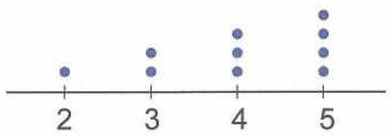
14. Vinh is making bunches of flowers using roses and lilies.

She has 36 roses and 60 lilies. All of the flowers must be used to make identical bunches.

What is the largest number of bunches she can make?

(A) 6
(B) 12
(C) 18
(D) 36

15. The dot plot below shows the marks achieved by 10 students on a quiz.



What is the mean of the marks achieved?

(A) 1.4
(B) 3.5
(C) 4.0
(D) 5.0

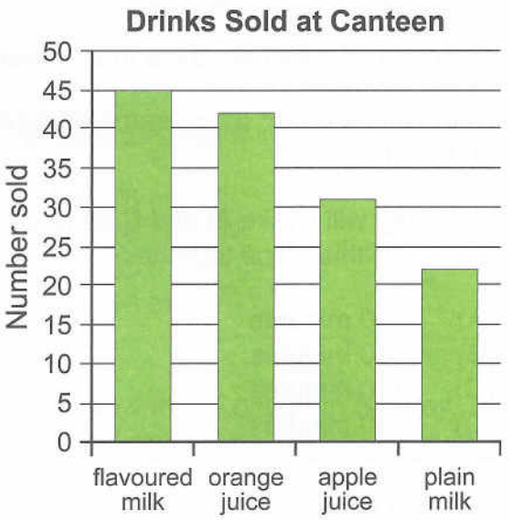
16. A rectangular dog pound has a perimeter of 240 m.

The length of the dog pound is five times its width.

What is the area of the dog pound?

(A) 2000 m^2
(B) 2304 m^2
(C) 3594 m^2
(D) 8000 m^2

17. This graph shows the number of 300 mL drinks sold at a school canteen one day.



Which of these statements is correct?

(A) The canteen sold more milk drinks than juice drinks.
(B) Approximately 40% of these drinks sold were orange juice.
(C) About twice as much orange juice was sold as apple juice.
(D) About one-third of all the milk sold was plain milk.

18. The Martians use the symbol ⋔ to perform martition.

If x and y are two numbers, they are martitioned as follows:

$x \pitchfork y = x + xy + y$

What is the value of $(2 \pitchfork 3) \pitchfork 4$?

(A) 28
(B) 30
(C) 48
(D) 59

19. Al and Cam are two cleaners.

Al cleans 50 m^2 of an office in 20 minutes.

Cam cleans 60 m^2 of the same office in 30 minutes.

How long will it take Al and Cam to clean 270 m^2 of this office together?

(A) 50 minutes
(B) 60 minutes
(C) 120 minutes
(D) 150 minutes

20. Anjali asked 8 people to write down a number under 40 and recorded the results.

11, 23, 25, 25, 29, 30, 32, 33

Which of these measures of Anjali's data is largest?

(A) range
(B) mean
(C) mode
(D) median

21. n stands for the number of guests who attended a party. Each guest was served 250 g of salad.

A 12 kg tray of pasta was also shared equally among the guests.

Which expression describes how much food each guest received, in kg?

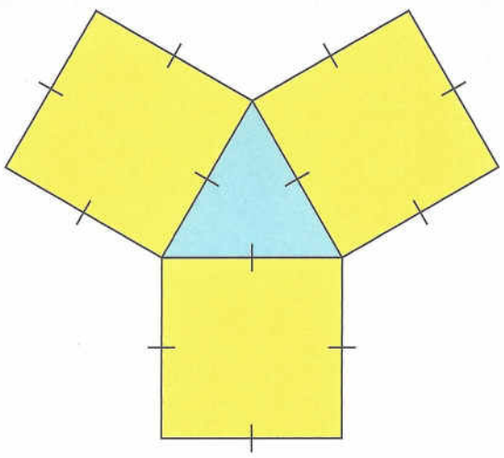
(A) $12n + 0.25$

(B) $\frac{1}{n} + \frac{1}{4}$

(C) $\frac{12}{n} + \frac{1}{4}$

(D) $\frac{n}{12} + 0.25$

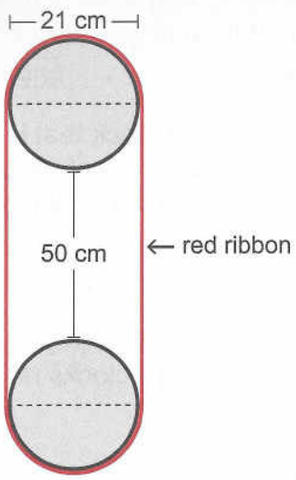
22. The perimeter of the figure below is $n\%$ of the sum of the perimeters of each of the four shapes.



What is the value of n?

(A) 60 (B) 67
(C) 75 (D) 80

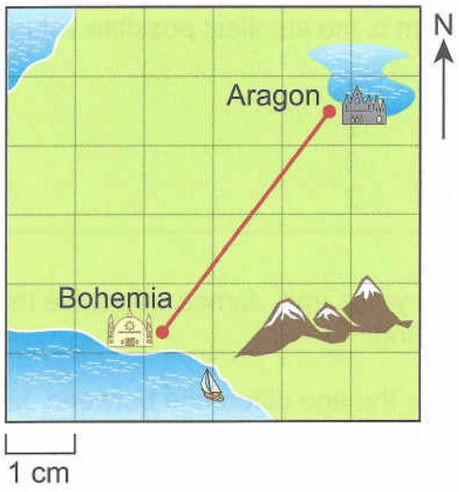
23. Two discs are connected by a red ribbon as shown.



What is the length of the ribbon, to the nearest cm?

(A) 232 (B) 208
(C) 166 (D) 142

24. Matt travelled from Bohemia to Aragon.



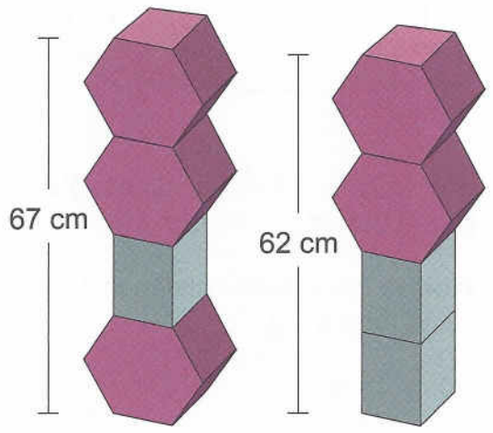
On this map, 1 cm represents 300 000 cm of actual distance.

Approximately how far did Matt travel?

(A) 7.5 km
(B) 12 km
(C) 75 km
(D) 120 km

25. Yara had blocks in the shape of rectangular prisms and regular hexagonal prisms.

She stacked her blocks as shown.



What is the height of one rectangular prism?

(A) 18 cm
(B) 16.75 cm
(C) 15.5 cm
(D) 13 cm

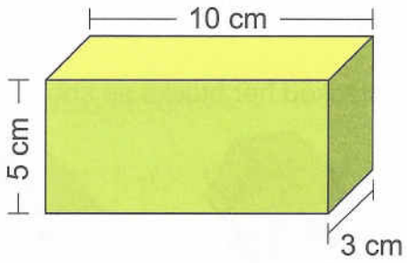
26. Arun flew from London to Sydney. The time in London is 10 hours behind Sydney.

Arun left London at 4 pm on Friday. He had a 2-hour stopover in Singapore and arrived in Sydney at 6 am on Sunday.

For how many hours was Arun flying?

(A) 24
(B) 26
(C) 28
(D) 30

27. Alan has this cardboard box.

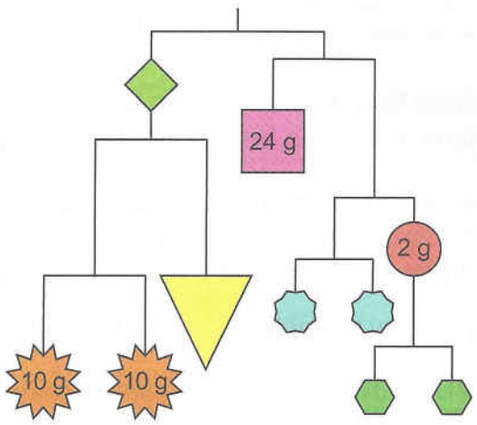


He wants to cut along some of the edges so the box opens to form a net.

What is the shortest distance Alan could cut to form a net?

(A) 18 cm
(B) 32 cm
(C) 33 cm
(D) 36 cm

28. Ardi joined some objects with cotton thread to make a mobile. The objects balance.



What is the sum of the masses of the unmarked objects?

(A) 46 g (B) 48 g
(C) 50 g (D) 96 g

29. Edward has an alarm clock that is set 4 minutes ahead of the actual time. The alarm is set to ring when it reaches 6:14 am. It then rings every 8 minutes after that.

Raj has an alarm clock that is set 3 minutes behind the actual time. The alarm is set to ring when it reaches 6:10 am. It then rings every 7 minutes after that.

What is the actual time when both Edward's and Raj's clocks ring together for the first time?

(A) 6:34 am
(B) 6:38 am
(C) 6:42 am
(D) 7:06 am

30. P and Q are positive integers.

$P = 8Q$

P is divisible by 6.

What is the smallest possible value for Q?

(A) 24
(B) 12
(C) 3
(D) 2

31. Ten years ago, James was twice the age of Ying.

Now the age difference between James and Ying is two years.

What is the sum of their ages now?

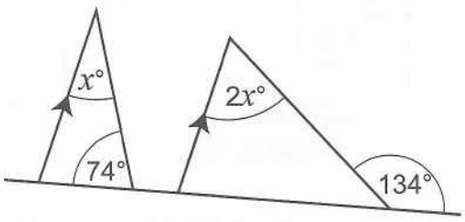
(A) 18
(B) 22
(C) 26
(D) 34

32. $\frac{1}{3} \times \frac{2}{4} \times \frac{3}{5} \times \frac{4}{6} \times \frac{5}{7} \times \ldots \ldots \ldots \times \frac{98}{100} =$?

(A) $\frac{1}{4950}$ (B) $\frac{1}{100}$

(C) $\frac{1}{150}$ (D) $\frac{49}{50}$

33. What is the value of x in the diagram?

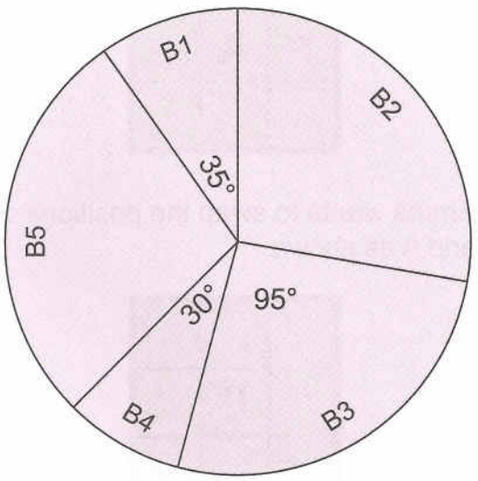


NOT TO SCALE

(A) 39
(B) 32
(C) 30
(D) 28

34. In a survey 1440 students were asked about the internet browser they use. Each student named one browser only.

The results of the survey are represented by this pie graph.

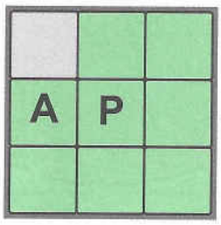


About how many more students use B5 than B4?

(A) 70
(B) 170
(C) 280
(D) 680

35. Emma has a square puzzle. There are 8 tiles, two of which have a letter on top. There is one space onto which an adjacent tile can slide.

Emma wants to swap the positions of P and A as shown.



Each time Emma slides a tile, she records it as 1 move.

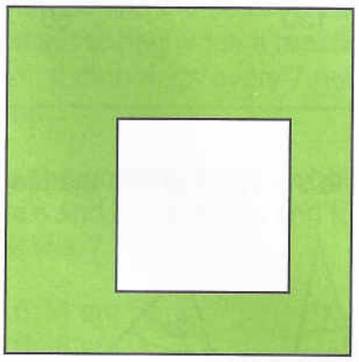
What is the least number of moves Emma will have to make?

(A) 6
(B) 10
(C) 13
(D) 15

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 small square is cut out of a larger square.

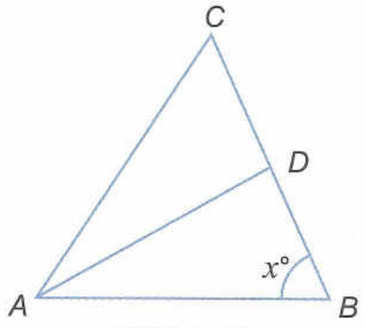


NOT TO SCALE

The side lengths of both squares, in centimetres, are whole numbers less than 25. The remaining area of the larger square is 57 cm^2.

What is the perimeter of the small square, in centimetres?

37. $AB=AD=DC$ and $AC=BC$.



NOT TO SCALE

What is the value of x?

38. A pronic number is the product of two consecutive positive integers.

110 is a pronic number as $110 = 11 \times 10$.

The sum of two pronic numbers is 240.

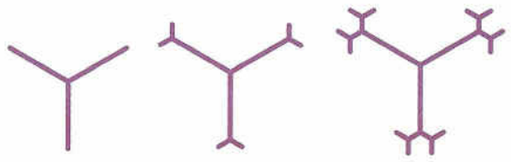
What is the difference between these two numbers?

39. The number x is the product of two prime numbers. (1 is not a prime number.)

$50 \leq x < 100$.

What is the sum of the largest and smallest possible values of x?

40. This pattern shows the first three stages in the development of a fractal.



Stage 1 Stage 2 Stage 3

How many lines will there be in Stage 6?

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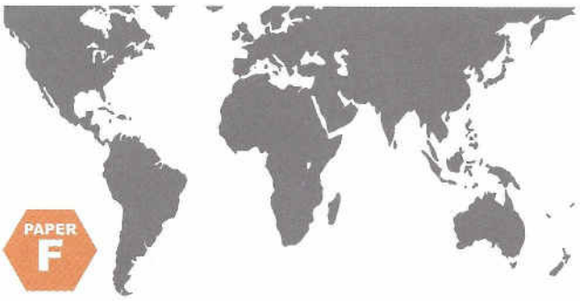
The following year levels should sit THIS Paper:

Australia	Year 8
Brunei	Form 2 & 3
Indonesia	Year 9
Malaysia	Form 2
New Zealand	Year 9
Pacific Region	Year 9
Singapore	Secondary 1
South Africa	Grade 8



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M | 2015 Mathematics Answer Keys

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

(Please turn ov

M | 2015 Mathematics Answer Keys

ICAS 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	B	A	B	A	D	C	D	B
32	D	D	D	A	B	A	B	C
33	B	B	A	C	C	D	D	A
34	A	D	C	D	D	C	C	D
35	C	B	B	B	A	B	B	C
36	B	C	D	6|06|006|0 6	396	32|032	189	33|033
37	C	B	B	28|028	225	72|072	33|033	298
38	D	D	A	12|012	74|074	180	75|075	585
39	D	A	C	90|090	32|032	146	127	128
40	A	B	B	640	180	189	26|026	242

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