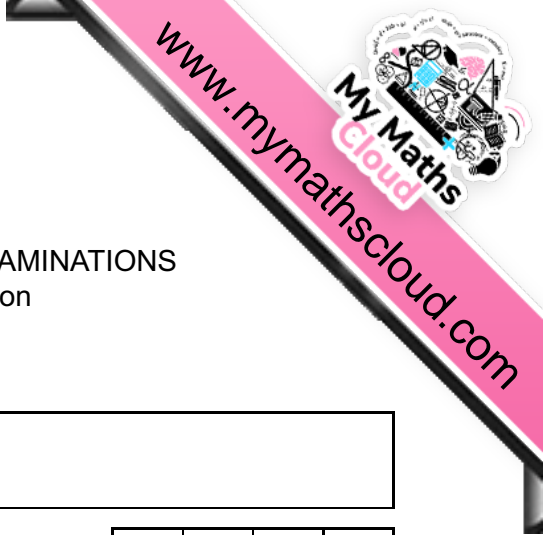




UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education



CANDIDATE NAME

CENTER NUMBER

CANDIDATE NUMBER



CAMBRIDGE IGCSE MATHEMATICS (US)

0444/03

Paper 3 (Core)

For examination from 2012

SPECIMEN PAPER

2 hours

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments
Electronic calculator

READ THESE INSTRUCTIONS FIRST

Write your Center number, candidate number, and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams, or graphs.
Do not use staples, paper clips, highlighters, glue, or correction fluid.
DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.
If work is needed for any question it must be shown in the space provided.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.
Give answers in degrees to one decimal place.
For π , use either your calculator value or 3.142

The number of points is given in parentheses [] at the end of each question or part question.
The total of the points for this paper is 104.

For Examiner's Use

This document consists of **16** printed pages.

Formula List

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle, radius r .

$$A = \pi r^2$$

Circumference, C , of circle, radius r .

$$C = 2\pi r$$

Lateral surface area, A , of cylinder of radius r , height h .

$$A = 2\pi rh$$

Surface area, A , of sphere of radius r .

$$A = 4\pi r^2$$

Volume, V , of prism, cross-sectional area A , length l .

$$V = Al$$

Volume, V , of cylinder of radius r , height h .

$$V = \pi r^2 h$$

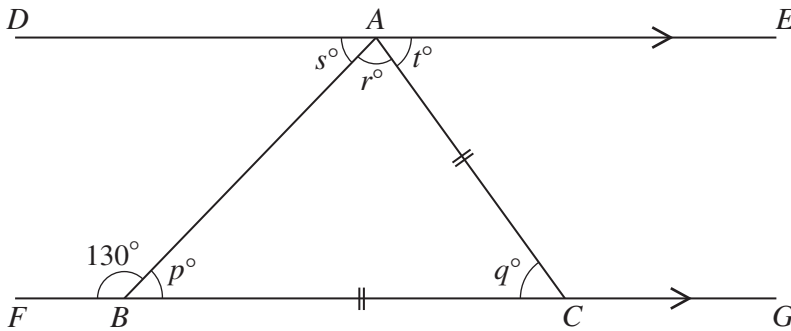
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

- 1 Tania sells her land for \$12 000.
She invests the money for 3 years at 6% per year **compound** interest.
Calculate the total amount of money she will have at the end of the 3 years.
Give your answer to the nearest dollar.

Answer \$ [4]

2



NOT TO SCALE

In the diagram above, DAE and $FBCG$ are parallel lines.
 $AC = BC$ and angle $FBA = 130^\circ$.

- (a) What is the special name given to triangle ABC ?

Answer (a) [1]

- (b) Work out the values of p , q , r , s , and t .

Answer (b) $p = \dots\dots\dots$ $q = \dots\dots\dots$ $r = \dots\dots\dots$

$s = \dots\dots\dots$ $t = \dots\dots\dots$ [5]

- 3 A bag contains 24 discs.
10 discs are red, 9 discs are green, and 5 discs are yellow.

- (a) The number of discs of each color can be shown by three sectors on a pie chart.
The sector angle for the red discs is 150° .

Work out the sector angle for

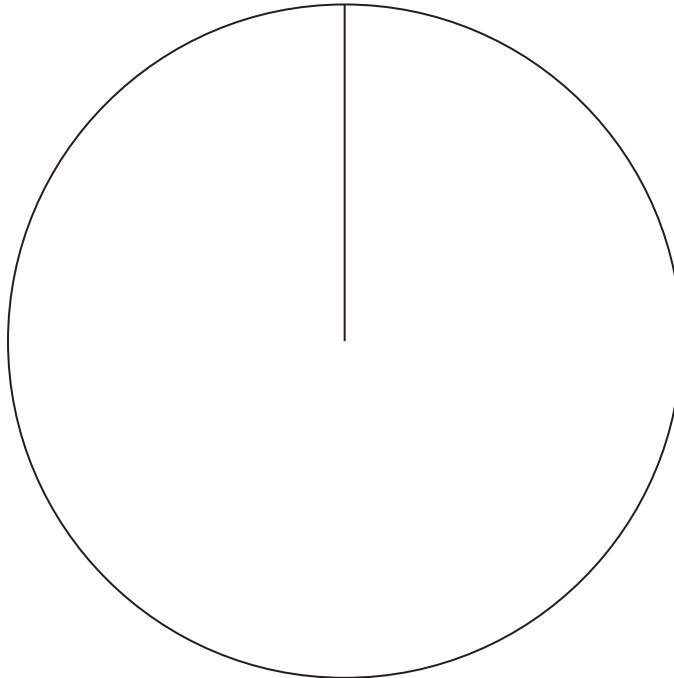
- (i) the green discs,

Answer (a)(i) [1]

- (ii) the yellow discs.

Answer (a)(ii) [1]

- (iii) Complete the pie chart below and label the sectors.



[2]

- (b) A disc is chosen at random.

Find, **as a fraction**, the probability of each of the following events.

- (i) Event A: the disc is red.

Answer (b)(i) [1]

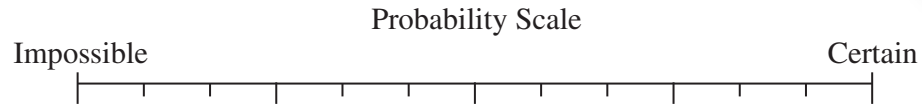
- (ii) Event B: the disc is red or yellow.

Answer (b)(ii) [1]

- (iii) Event C: the disc is **not** yellow.

Answer (b)(iii) [1]

(c)



(c)(i)

(c)(ii)

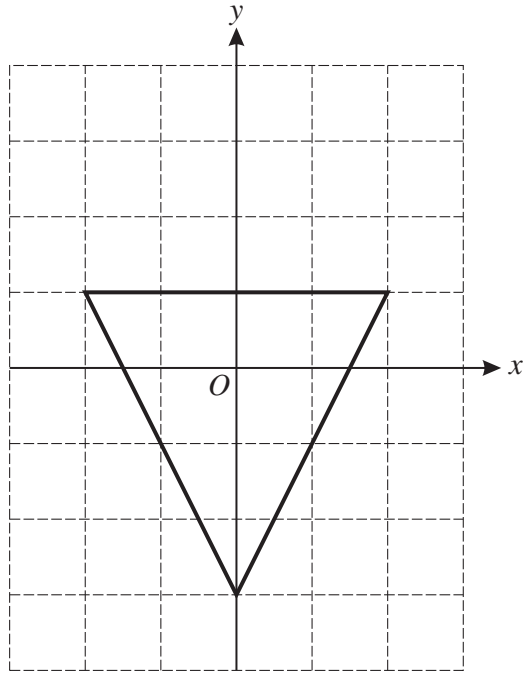
The diagram shows a horizontal probability scale.

Write on the dotted lines in the diagram, the probability of

(i) an impossible event, [1]

(ii) a certain event. [1]

(d) Using the notation \uparrow_A , \uparrow_B , and \uparrow_C , mark the positions of your three answers in **part (b)** on the Probability Scale diagram in **part (c)**. [3]



The triangle in the diagram above is isosceles.

- (a) How many lines of symmetry does this triangle have?

Answer (a) [1]

- (b) Write down the order of rotational symmetry of this triangle.

Answer (b) [1]

- (c) On the grid above, draw the rotation of this triangle about O through 180° . [2]

- (d) Describe fully another single transformation that maps this triangle onto your answer for part (c).

Answer (d)
 [2]

- 5 Alphonse, his wife, and child fly from Madrid to the Olympic Games in Beijing.
The adult plane fare is 450 euros.
The child plane fare is 68% of the adult fare.

(a) Show that the total plane fare for the family is 1206 euros. Show all your working clearly.

Answer (a)

[3]

(b) The ratio of the money spent on plane fares : accommodation : tickets = 6 : 5 : 3.

Calculate the **total** cost.

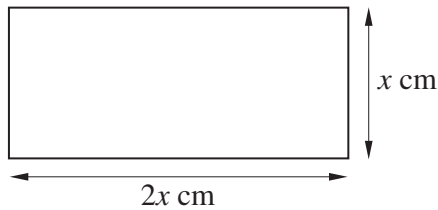
Answer (b) euros [3]

(c) Alphonse changes 500 euros into Chinese Yuan at a rate of 1 euro = 9.91 Chinese Yuan.

How many Chinese Yuan does he receive?

Answer (c) Yuan [2]

6 (a)



NOT TO SCALE

The perimeter of the rectangle in the diagram above is 36 centimeters.

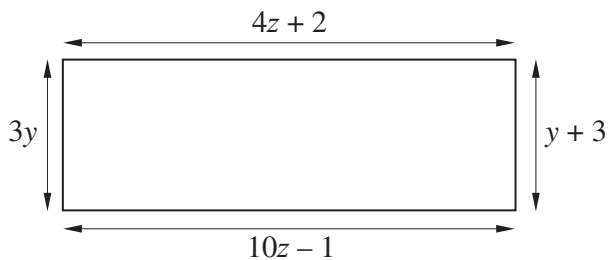
(i) Find the value of x .

Answer (a)(i) $x = \dots\dots\dots$ [2]

(ii) Using this value of x , calculate the area of the rectangle.

Answer (a)(ii) $\dots\dots\dots$ cm^2 [2]

(b)



NOT TO SCALE

The diagram above shows another rectangle.

(i) In this rectangle $3y = y + 3$.
Solve the equation to find y .

Answer (b)(i) $y = \dots\dots\dots$ [2]

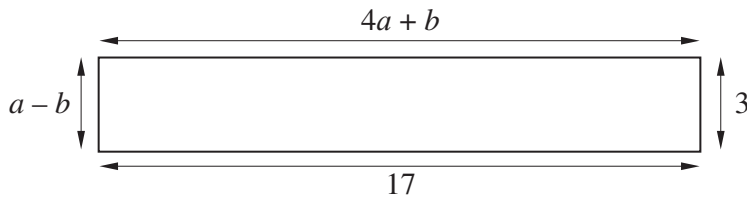
(ii) Write down an equation in z .

Answer (b)(ii) $\dots\dots\dots$ [1]

(iii) Solve the equation in part (b)(ii) to find z .

Answer (b)(iii) $z = \dots\dots\dots$ [3]

(c)

NOT TO
SCALE

The diagram above shows another rectangle.

(i) Write down two equations in a and b .

Answer (c)(i)

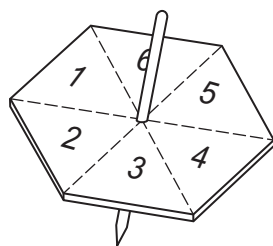
..... [2]

(ii) Solve these two equations simultaneously to find a and b .

Answer (c)(ii) $a =$

$b =$ [3]

7



Omar tests a six-sided spinner.

The results of 60 spins are shown below.

3	3	6	5	6	1	2	6	5	2
3	4	4	4	3	4	6	5	2	1
6	3	6	4	1	5	3	6	2	6
6	6	3	6	1	6	6	5	1	6
1	6	2	5	3	6	4	2	3	5
1	4	4	1	5	4	6	6	2	3

(a) Use these results to complete the frequency table.

Number	Frequency
1	
2	
3	
4	
5	
6	

[3]

(b) Write down the mode.

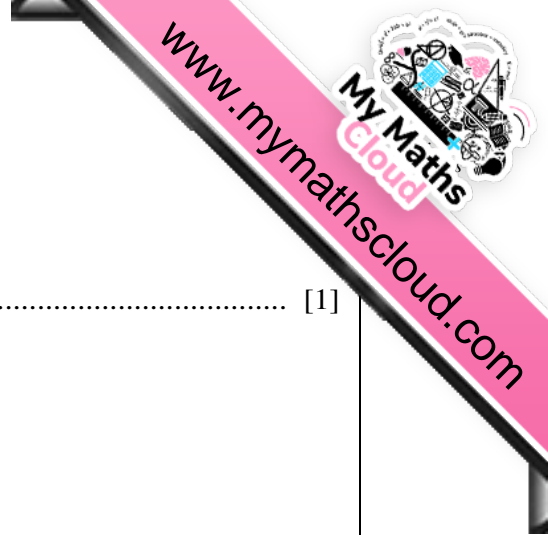
Answer (b) [1]

(c) Find the median.

Answer (c) [2]

(d) Calculate the mean.
Give your answer correct to one decimal place.

Answer (d) [3]

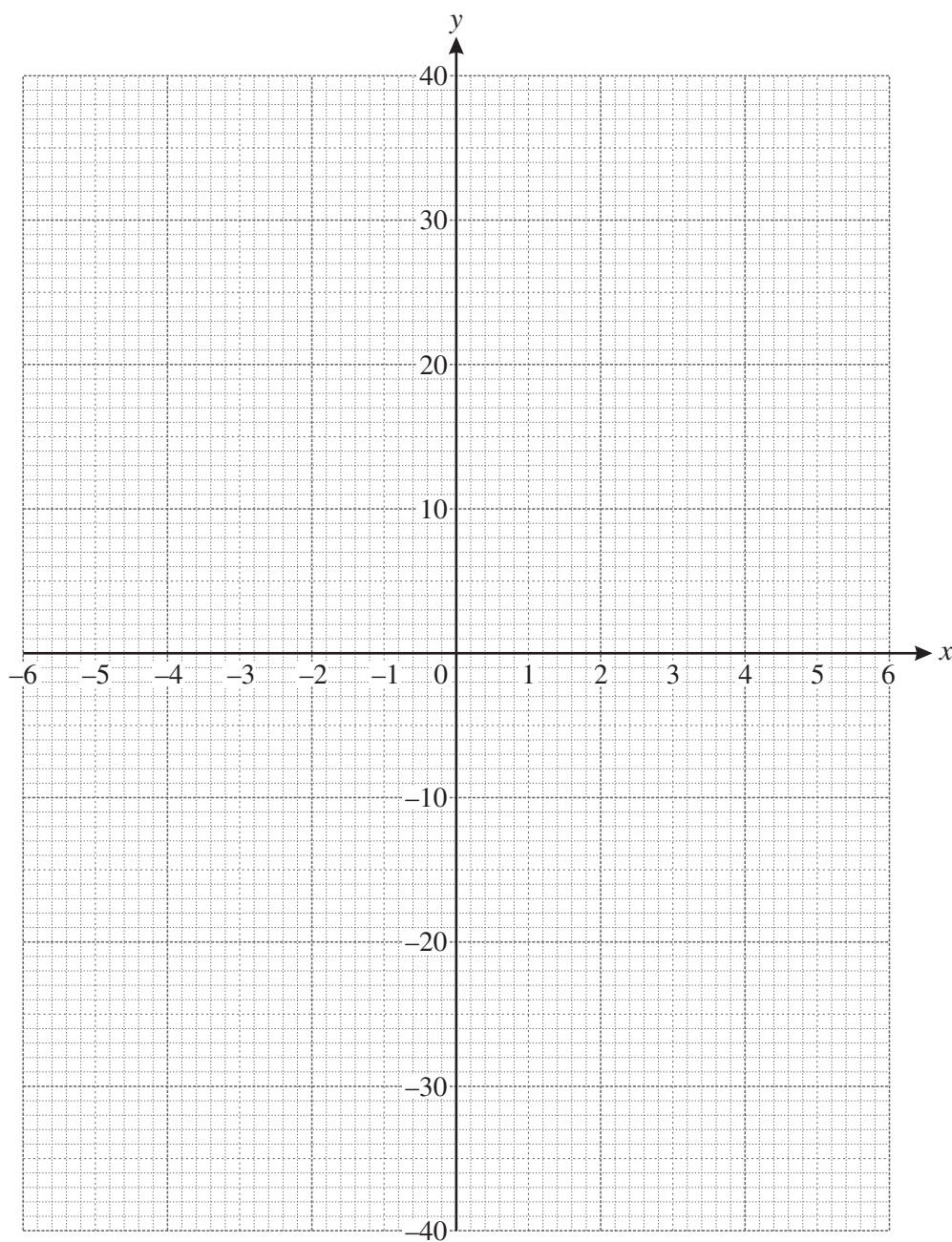


- 8 (a) Complete the table for the function $y = \frac{36}{x}$, ($x \neq 0$).

x	-6	-5	-4	-3	-2	-1		1	2	3	4	5	6
y		-7.2	-9		-18				18		9	7.2	

[3]

- (b) On the grid below, draw the graph of $y = \frac{36}{x}$ for $-6 \leq x \leq -1$ and $1 \leq x \leq 6$.



[4]

- (c) Use your graph to find x when $y = 21$.

Answer (c) $x = \dots\dots\dots$ [1]

- (d) Complete the table for the function $y = x^2$.

x	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
y		25	16		4	1		1	4		16	25	

[2]

- (e) On the same grid, draw the graph of $y = x^2$ for $-6 \leq x \leq 6$.

[4]

- (f) Write down the coordinates of the point of intersection of the graphs of $y = \frac{36}{x}$ and $y = x^2$.

Answer (f) ($\dots\dots\dots$, $\dots\dots\dots$) [1]

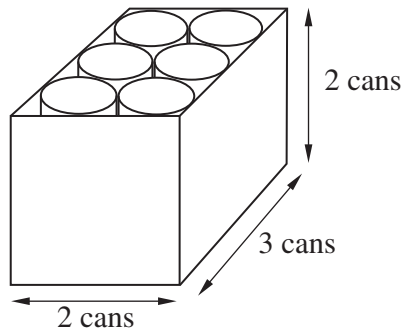
- 9 (a) (i) Calculate the area of a circle with radius 3.7 centimeters.

Answer (a)(i) cm² [2]

- (ii) A can of tomatoes is a cylinder with radius 3.7 centimeters and height h centimeters. The volume of the cylinder is 430 cm³.

Calculate h .

Answer (a)(ii) $h =$ [2]



NOT TO SCALE

- (b) Twelve cans fit exactly inside a box 3 cans long, 2 cans wide, and 2 cans high.

- (i) Write down the length, width, and height of the box.

Answer (b)(i) length = cm

width = cm

height = cm [3]

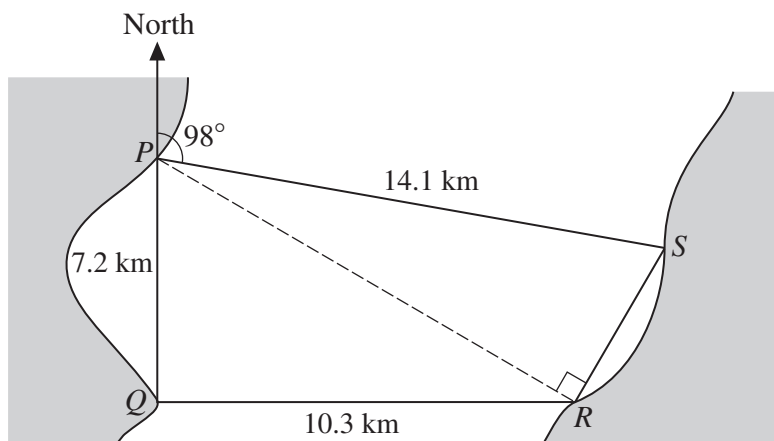
- (ii) Calculate the volume of the box.

Answer (b)(ii) cm³ [2]

- (iii) Calculate the percentage of the volume of the box occupied by the cans.

Answer (b)(iii) % [3]

10



NOT TO SCALE

P , Q , R , and S are ferry ports on a wide river, as shown in the diagram above.

A ferry sails from P , stopping at Q , R , and S before returning to P .

(a) Q is 7.2 kilometers due south of P and R is 10.3 kilometers due east of Q .

(i) Show by calculation that angle $QPR = 55^\circ$.

[2]

(ii) Write down the bearing of R from P .

Answer (a)(ii) [1]

(b) The bearing of S from P is 098° and $SP = 14.1$ km.

(i) Explain why angle $RPS = 27^\circ$.

Answer (b)(i) [1]

(ii) Angle $PRS = 90^\circ$. Calculate the distance RS .

Answer (b)(ii) $RS =$ km [2]

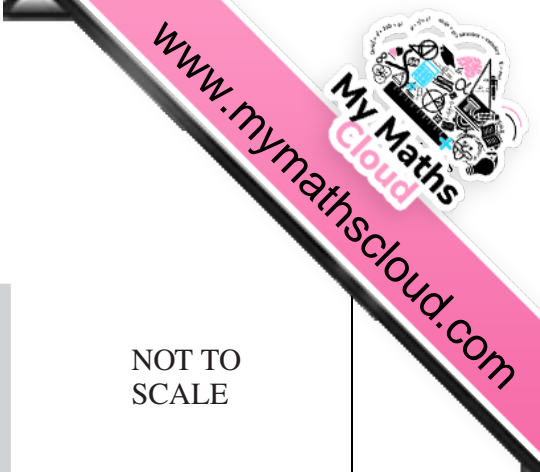
(iii) Find the total distance the ferry sails.

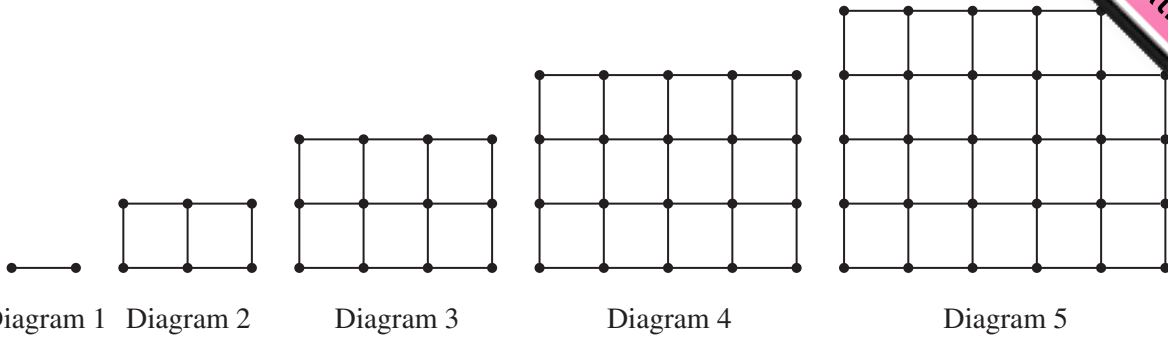
Answer (b)(iii) km [1]

(c) The total sailing time for the ferry is 4 hours 30 minutes.

Calculate the average sailing speed, in kilometers per hour, for the whole journey.

Answer (c) km/h [2]





Look at the sequence of five diagrams above.

Diagram 1 has 2 dots and 1 line.

Diagram 2 has 6 dots and 7 lines.

The numbers of dots and lines in each of the diagrams are shown in the table below.

Diagram number	1	2	3	4	5	6	7
Number of dots	2	6	12	20	30		
Number of lines	1	7	17	31	49		

(a) Fill in the empty spaces in the table for Diagrams 6 and 7. [4]

(b) How many dots are there in Diagram n ?

Answer (b) [2]

(c) The number of lines in Diagram n is $2n^2 - 1$.

Which diagram has 287 lines?

Answer (c) [2]