Young Lives
An International Study of Childhood Poverty

Young Lives 2016-17 School Surveys

Item level analysis

Ethiopia

Wave 1

Subject: Mathematics

This booklet contains Maths items administered to students in Grades 7 and 8, at Wave 1 of Young Lives' school survey in Ethiopia. This survey took place in 2016-17.

The item-level analyses in this booklet were undertaken by Educational Initiatives, Ahmedabad, India.

Items were selected following extensive piloting. For more details on item sources and the test development process, see Rossiter et al., (2017). Young Lives School Survey, 2016–17: Ethiopia Country Report.

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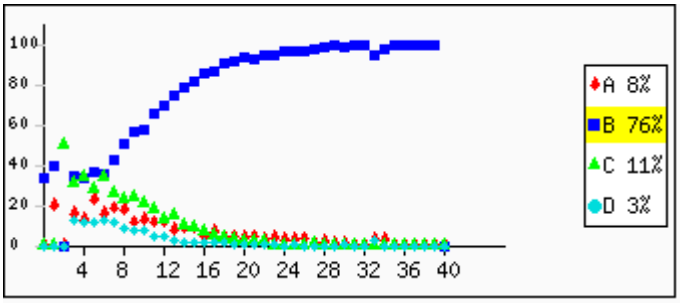
Question no: 1

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

2488 ÷ 8 =
A: 11
B: 311
C: 2480
D: 2496

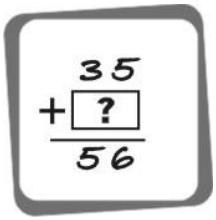


Overall	A: 8.3%	B: **76.4%**	C: 11.3%	D: 3.5%	Invalid Answer: 0.2%	Not Attempted: 0.4%

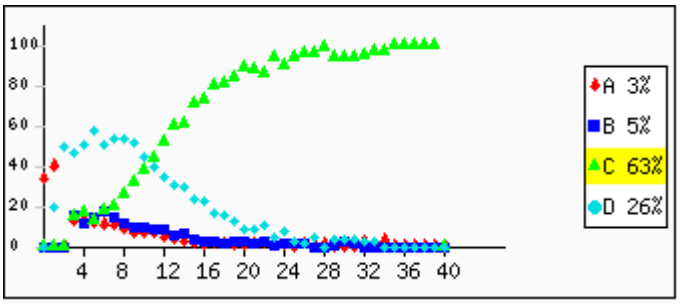
Question no: 2

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

A number when added to 35 gives 56.



What is the number?
A: 12
B: 20
C: 21
D: 91

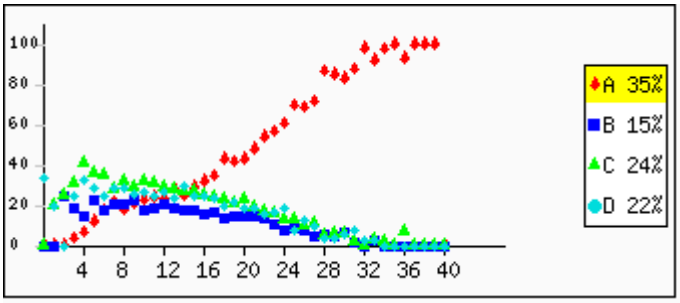


Overall	A: 3.5%	B: 5.7%	C: **63.2%**	D: 26.9%	Invalid Answer: 0.3%	Not Attempted: 0.4%

Question no: 3

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

7341 is completely divisible by _____.
A: 3
B: 5
C: 7
D: 9

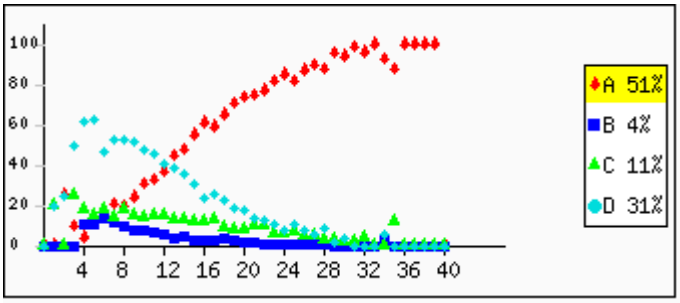


Overall	A: **35.1%**	B: 16.0%	C: 25.0%	D: 22.4%	Invalid Answer: 0.5%	Not Attempted: 1.1%

Question no: 4

Skill: Integers and Rational numbers, Powers and Bases **Paper Set: A, Medium: English**

3 ones + 7 tens = _____.
A: 73
B: 40
C: 37
D: 10

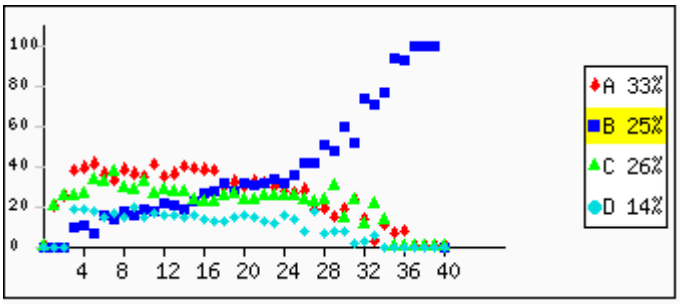


Overall	A: **51.4%**	B: 4.3%	C: 11.9%	D: 31.3%	Invalid Answer: 0.4%	Not Attempted: 0.6%

Question no: 5

Skill: Integers and Rational numbers, Powers and Bases **Paper Set: A, Medium: English**

-4 - (-5) = _____.
A: -1
B: 1
C: -9
D: 9

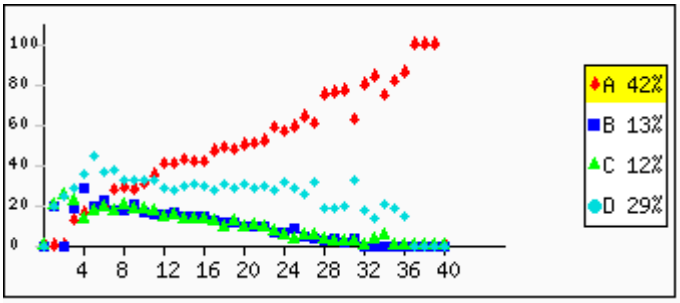


Overall	A: 33.6%	B: **25.0%**	C: 26.2%	D: 14.4%	Invalid Answer: 0.4%	Not Attempted: 0.4%

Question no: 6

Skill: Integers and Rational numbers, Powers and Bases **Paper Set: A, Medium: English**

Which of these is the cube root of 729?
A: 9
B: 13
C: 19
D: 27

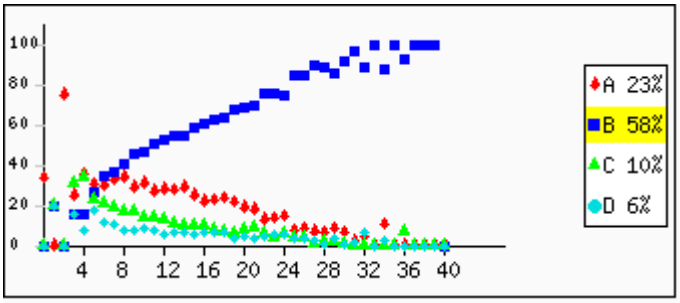


Overall	A: **42.5%**	B: 13.6%	C: 12.9%	D: 29.9%	Invalid Answer: 0.3%	Not Attempted: 0.9%

Question no: 7

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

Which difference is closest to 300,000?
A: 100,000 – 50,000
B: 500,000 – 300,000
C: 900,000 – 800,000
D: 800,000 – 100,000

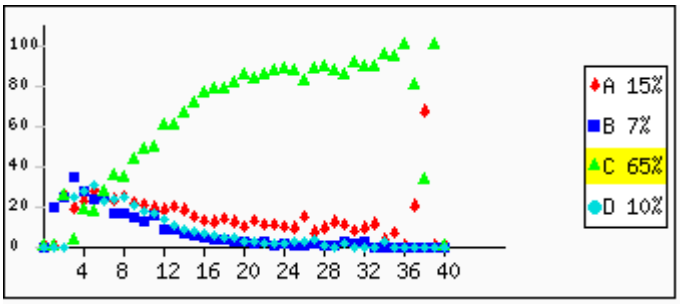


Overall	A: 23.4%	B: **58.6%**	C: 10.8%	D: 6.3%	Invalid Answer: 0.2%	Not Attempted: 0.7%

Question no: 8

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

2.34 + 7.65 =
A: 99.9
B: 0.99
C: 9.99
D: 999



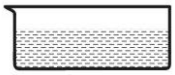
Overall	A: 15.8%	B: 7.8%	C: **65.2%**	D: 10.3%	Invalid Answer: 0.4%	Not Attempted: 0.5%

Question no: 9

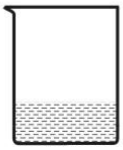
Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

4 jars of different shapes are filled with water upto the same height as shown.

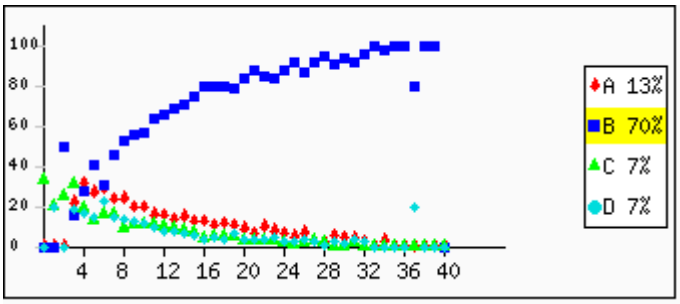
Which of them has the **least** amount of water in it?

A: 

B:

C: 

D:

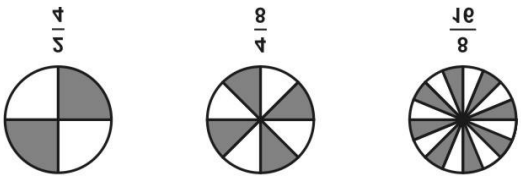


Overall	A: 13.6%	B: **70.9%**	C: 7.5%	D: 7.2%	Invalid Answer: 0.2%	Not Attempted: 0.6%

Question no: 10

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

Which of the following fractions is the greatest?

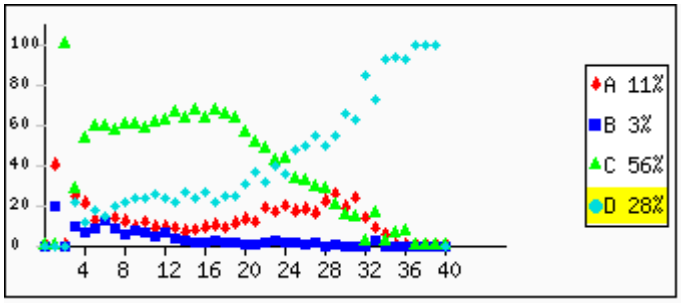


A: 24

B: 48

C: 816

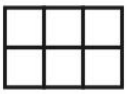
D: (all are equal)

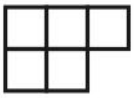


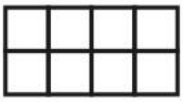
Overall	A: 11.0%	B: 3.6%	C: 56.8%	D: **28.1%**	Invalid Answer: 0.2%	Not Attempted: 0.3%

Question no: 11

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

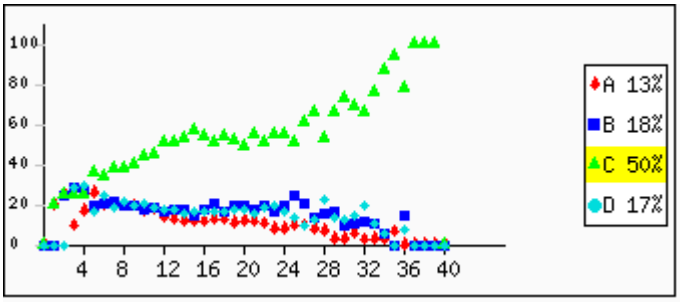
If  represents 75%, which of the following represents 125%?

A: 

B: 

C:

D:



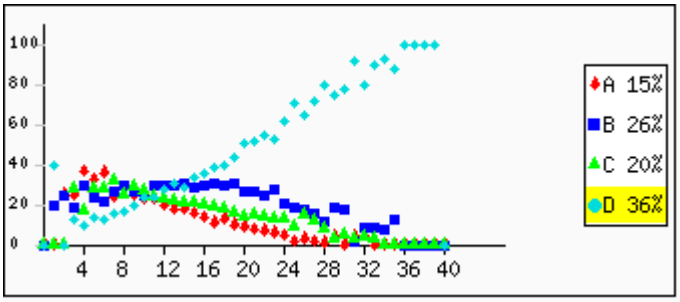
Overall	A: 13.2%	B: 18.1%	C: **50.2%**	D: 17.6%	Invalid Answer: 0.3%	Not Attempted: 0.6%

Question no: 12

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

What fraction of the shape below is shaded?

A: 1
B: 12
C: more than 12
D: less than 12

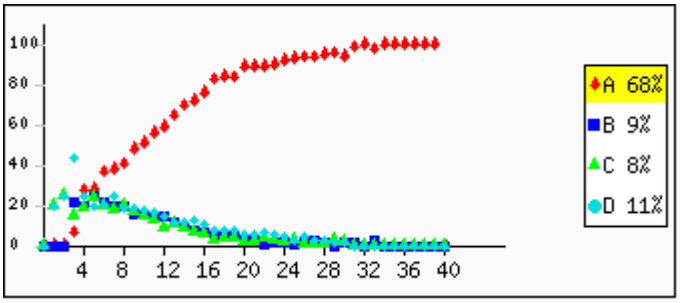


Overall	A: 15.7%	B: 26.7%	C: 20.3%	D: **36.4%**	Invalid Answer: 0.4%	Not Attempted: 0.7%

Question no: 13

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

What is the place value of 5 in 54620?
A: ten thousands
B: hundreds
C: tens
D: ones

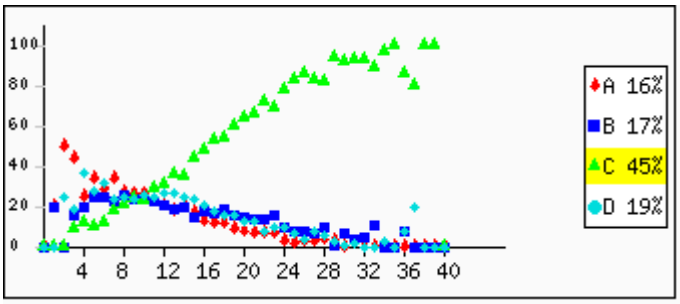


Overall	A: **68.9%**	B: 9.6%	C: 8.9%	D: 11.6%	Invalid Answer: 0.4%	Not Attempted: 0.6%

Question no: 14

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

4.465 – 1.286 =
A: 5.751
B: 3.189
C: 3.179
D: 3.279

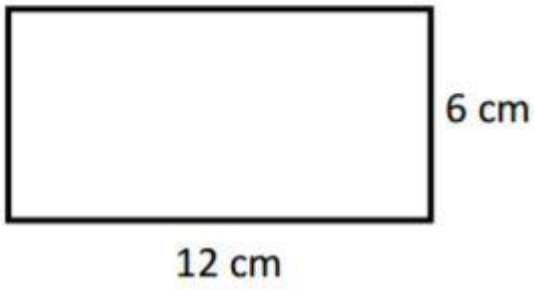


Overall	A: 16.2%	B: 17.8%	C: **45.1%**	D: 19.6%	Invalid Answer: 0.2%	Not Attempted: 1.0%

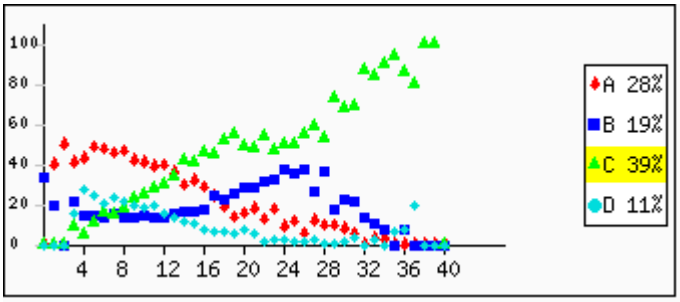
Question no: 15

Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

Calculate the perimeter of the following rectangle:



A: 18 cm
B: 72 cm
C: 36 cm
D: 24 cm

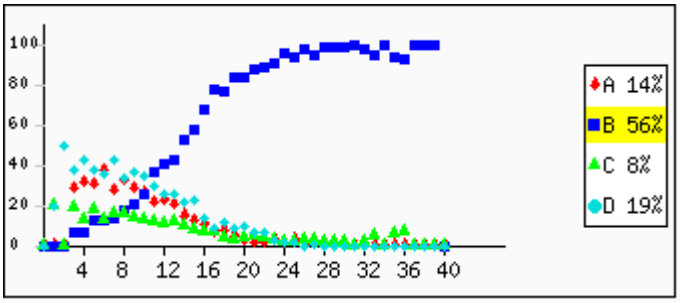


Overall	A: 28.8%	B: 19.9%	C: **39.2%**	D: 11.5%	Invalid Answer: 0.2%	Not Attempted: 0.4%

Question no: 16

Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

If X = 6 and Y = 9 and Z = 12 then X + Y – Z =
A: 0
B: 3
C: 6
D: 15

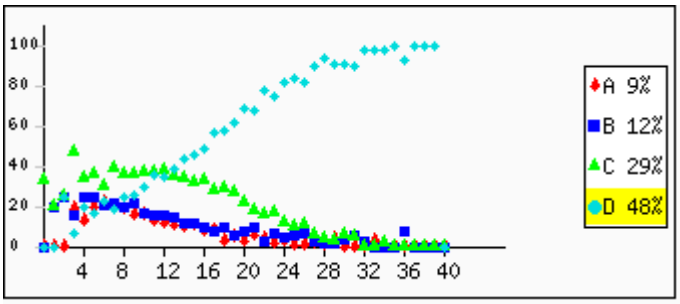


Overall	A: 14.7%	B: **56.4%**	C: 8.9%	D: 19.6%	Invalid Answer: 0.3%	Not Attempted: 0.2%

Question no: 17

Skill: Number sense, related concepts and basic number competency **Paper Set: A, Medium: English**

Which number is the smallest?
A: 3,124,300
B: 3,214,243
C: 3,124,030
D: 3,102,430

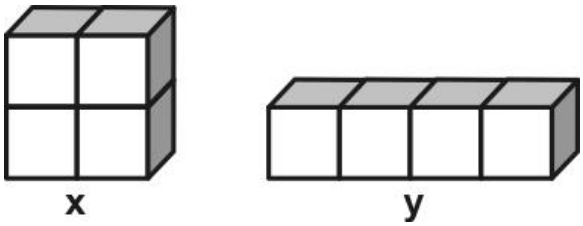


Overall	A: 9.3%	B: 12.0%	C: 29.1%	D: **48.7%**	Invalid Answer: 0.4%	Not Attempted: 0.6%

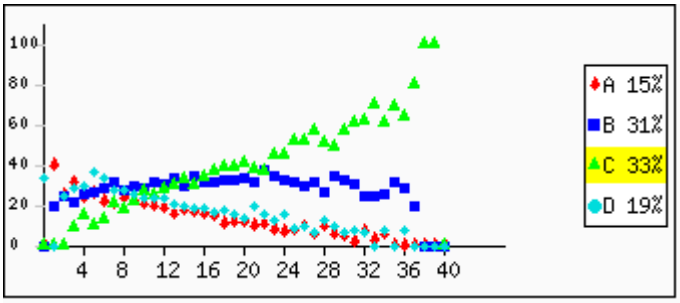
Question no: 18

Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

Cuboid x and Cuboid y below are both made of 4 identical unit cubes each.



What can be said about volume of x and y?
A: Volume of x is greater than volume of y.
B: Volume of x is less than volume of y.
C: Volume of x is same as volume of y.
D: Volume of x and volume of y can't be determined.



Overall	A: 15.4%	B: 31.2%	C: **33.1%**	D: 19.5%	Invalid Answer: 0.3%	Not Attempted: 0.5%

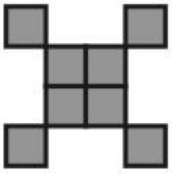
Question no: 19

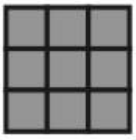
Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

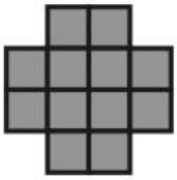
4 identical tiles are used to form the shape shown below. The area of the shape is 16 sq cm.

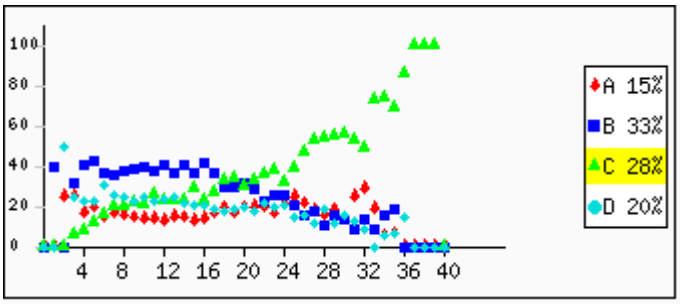
Some more identical tiles were added to the above shape to form another shape with area 36 sq cm. Which of the following could be the new shape formed?

A:

B: 

C: 

D: 



Overall	A: 15.9%	B: 33.7%	C: **28.3%**	D: 20.9%	Invalid Answer: 0.3%	Not Attempted: 0.9%

Question no: 20

Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

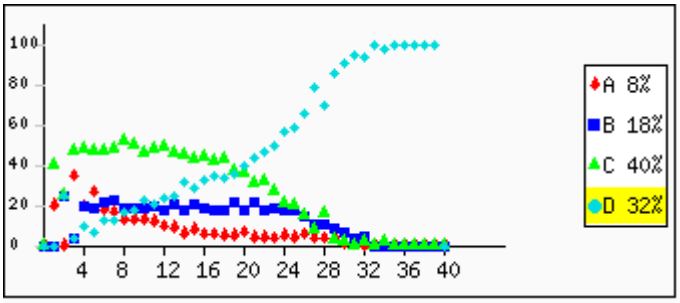
If A = 2 what is 3A equal to?

A: 2

B: 3

C: 5

D: 6

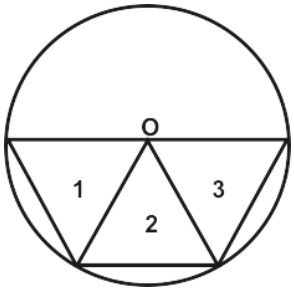


Overall	A: 8.2%	B: 18.2%	C: 40.2%	D: **32.9%**	Invalid Answer: 0.2%	Not Attempted: 0.3%

Question no: 21

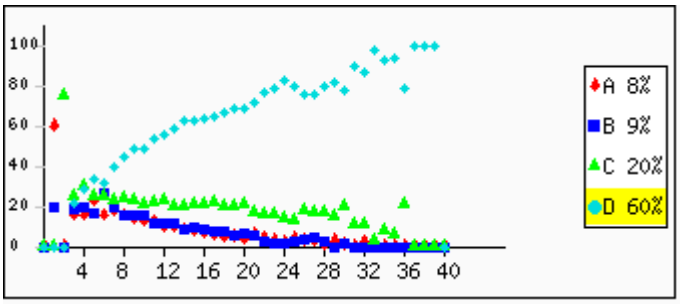
Skill: Basic Shapes, Geometry and Visual estimation **Paper Set: A, Medium: English**

Three equilateral triangles are inscribed in a circle with center O as shown below.



Which of the three triangles are congruent?

A: triangles 1 and 2 only
B: triangles 2 and 3 only
C: triangles 1 and 3 only
D: all the three triangles



Overall	A: 8.4%	B: 9.8%	C: 20.6%	D: **60.8%**	Invalid Answer: 0.3%	Not Attempted: 0.2%

Question no: 22

Skill: Basic Shapes, Geometry and Visual estimation **Paper Set: A, Medium: English**

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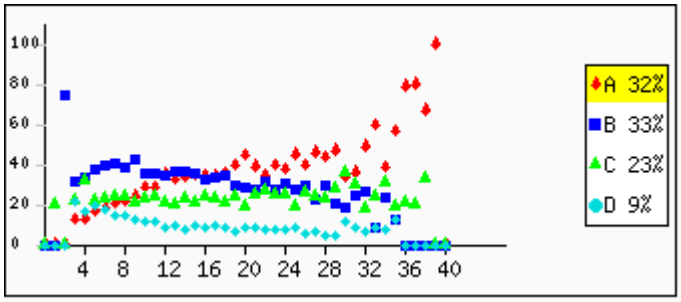
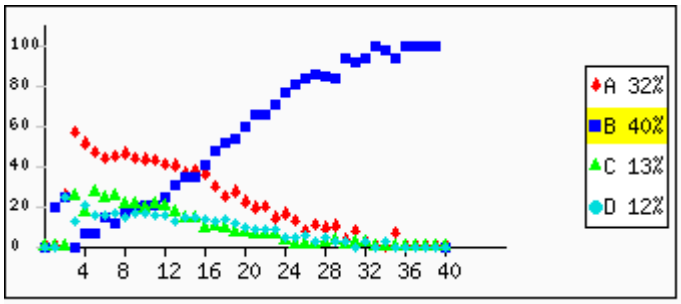


Overall	A: **32.8%**	B: 33.7%	C: 23.1%	D: 9.7%	Invalid Answer: 0.3%	Not Attempted: 0.4%

Question no: 23

Skill: Integers and Rational numbers, Powers and Bases **Paper Set: A, Medium: English**

√81 =
A: 8.1
B: 9
C: 18
D: 40.5

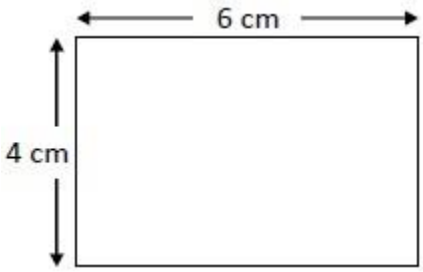


Overall	A: 32.3%	B: **40.6%**	C: 13.6%	D: 12.5%	Invalid Answer: 0.4%	Not Attempted: 0.6%

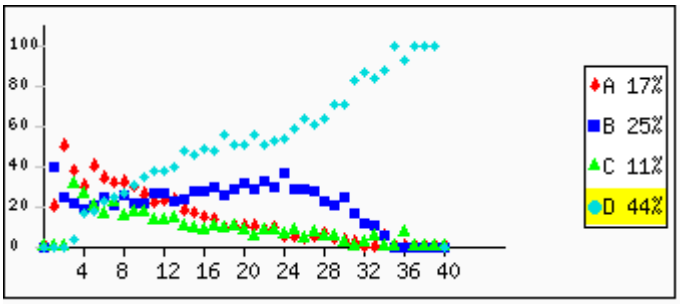
Question no: 24

Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

Here is a rectangle with length 6 centimetres and width 4 centimetres. The length of its boundary is called its perimeter.



Which of these gives the perimeter of the rectangle in centimetres?
A: 6 + 4
B: 6 x 4
C: 6 x 4 x 2
D: 6 + 4 + 6 + 4



Overall	A: 17.7%	B: 25.7%	C: 11.6%	D: **44.1%**	Invalid Answer: 0.4%	Not Attempted: 0.5%

Question no: 25

Skill: Basic Shapes, Geometry and Visual estimation**Paper Set: A, Medium: English**

Farida has made a pattern with pieces of chart paper.

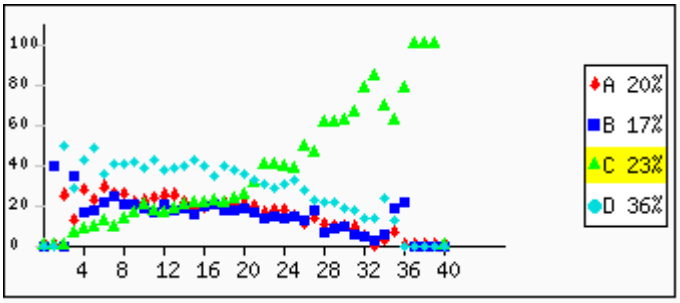
What will come next in the pattern?

A:

B:

C:

D:

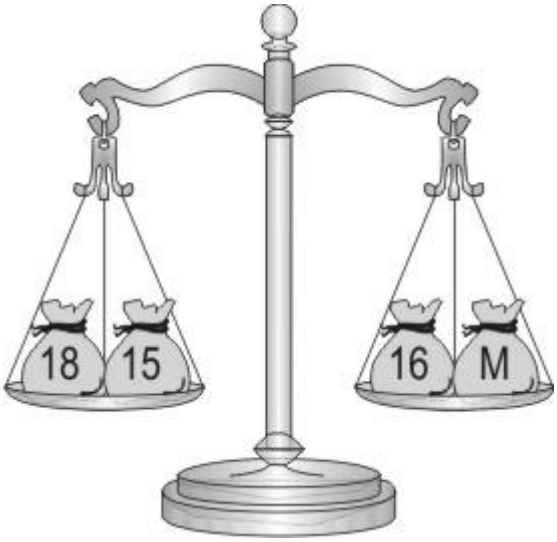


Overall	A: 20.5%	B: 17.8%	C: **24.0%**	D: 36.8%	Invalid Answer: 0.3%	Not Attempted: 0.7%

Question no: 26

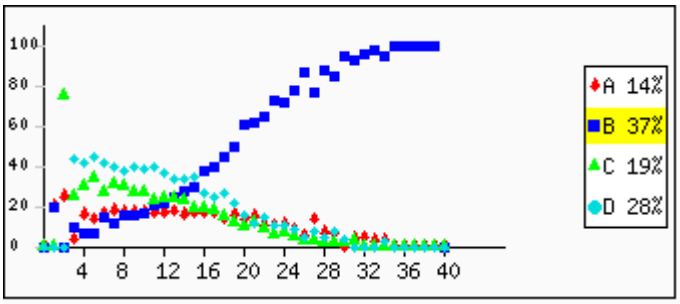
Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

Jim has balanced some bags of marbles. All the marbles are of the same weight. The number of marbles in each bag is written on it.



How many marbles are there in the bag marked M?

A: 13
B: 17
C: 33
D: 49

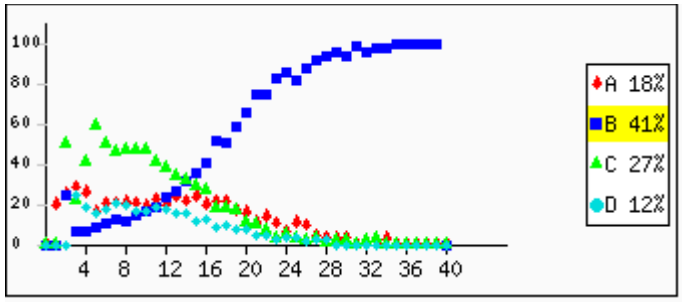


Overall	A: 14.8%	B: **37.6%**	C: 19.1%	D: 28.0%	Invalid Answer: 0.3%	Not Attempted: 0.2%

Question no: 27

Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

This redacted item is not for public release.

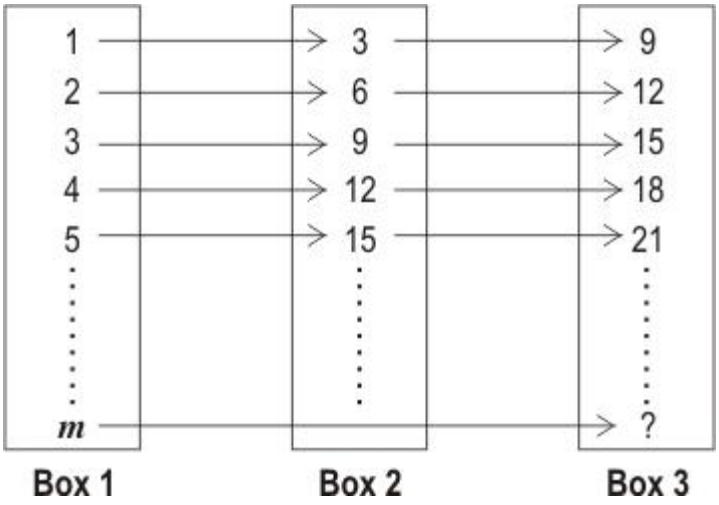


Overall	A: 18.0%	B: **41.3%**	C: 28.0%	D: 12.1%	Invalid Answer: 0.2%	Not Attempted: 0.4%

Question no: 28

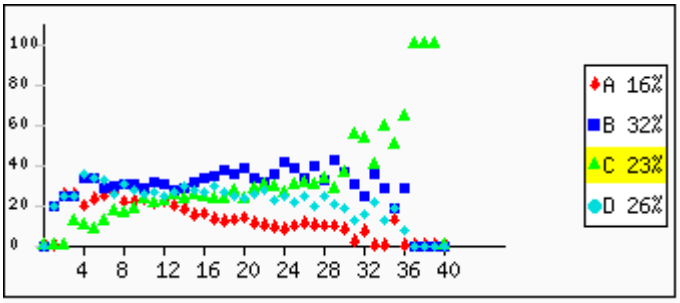
Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

A certain common formula converts the numbers in Box 1 to the corresponding ones in Box 2. Another formula then converts the numbers in Box 2 to the corresponding ones in Box 3:



If we wanted to convert a number *m* in Box 1 directly to the corresponding number in Box 3, we could use the formula _____.

A: $3m + 2$
B: $3m \times 3$
C: $3(m+2)$
D: $m + 2 \times 3$

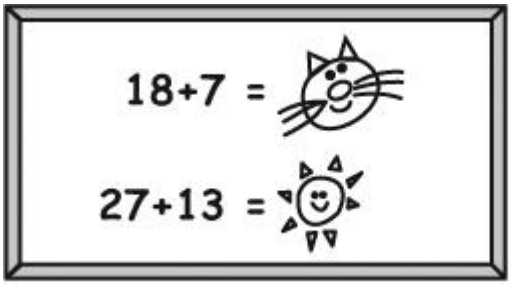


Overall	A: 16.4%	B: 32.4%	C: **23.8%**	D: 26.2%	Invalid Answer: 0.3%	Not Attempted: 0.9%

Question no: 29

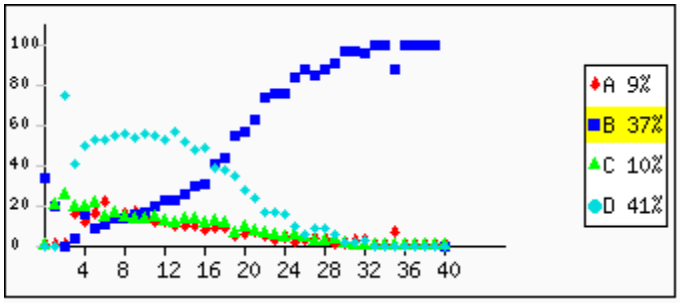
Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

Look at the picture below.



What is ?

A: 6
B: 15
C: 20
D: 40



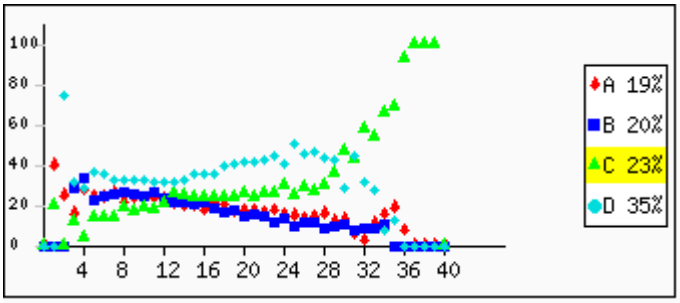
Overall	A: 9.1%	B: **37.7%**	C: 10.8%	D: 41.3%	Invalid Answer: 0.4%	Not Attempted: 0.7%

Question no: 30

Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

For any numbers x and y such that $x = 70 + y$, what can be said about x and y?

A: $x = y$
B: $x < y$
C: $x > y$
D: None of the above can be said as the exact values of x or y are NOT known.



Overall	A: 19.8%	B: 20.1%	C: **23.5%**	D: 35.7%	Invalid Answer: 0.3%	Not Attempted: 0.6%

Question no: 31

Skill: Fractions, Decimals, Ratios and Percentages **Paper Set: A, Medium: English**

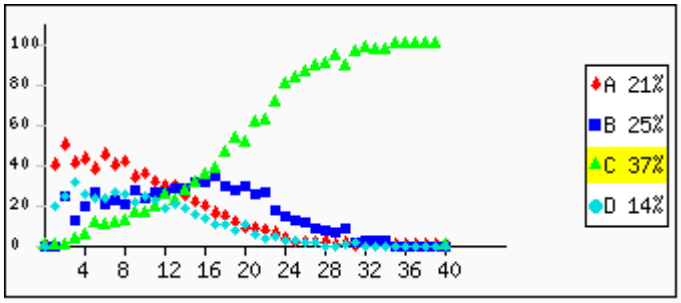
Which fraction is the simplified form of 820 ?

A: 120

B: 45

C: 25

D: 48



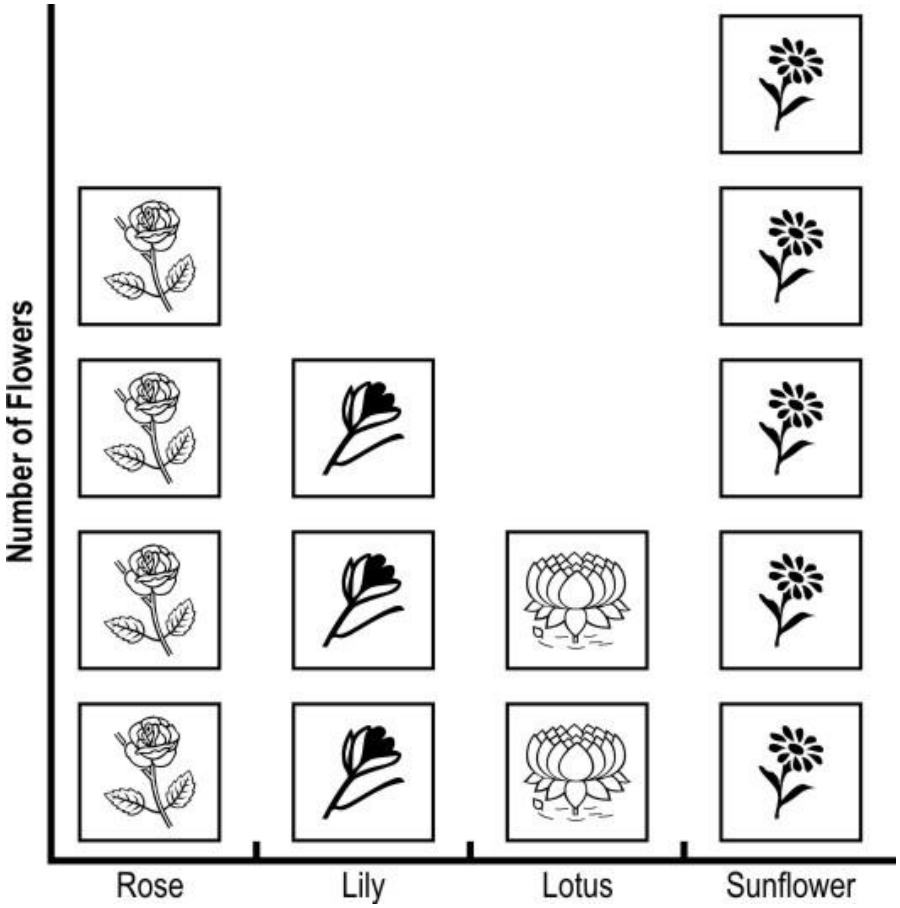
Overall	A: 21.9%	B: 25.0%	C: **37.5%**	D: 14.9%	Invalid Answer: 0.3%	Not Attempted: 0.4%

Question no: 32

Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

Sheel counted the number of flowers in her garden. She made the following chart.

Study the chart and answer the following question.



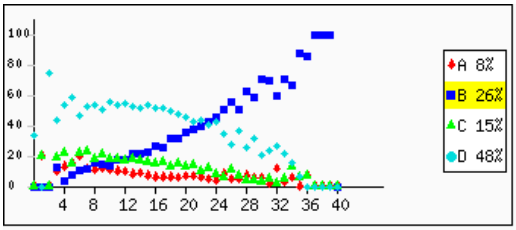
How many more sunflowers were there than lilies in the garden?

A: 1

B: 2

C: 3

D: 5



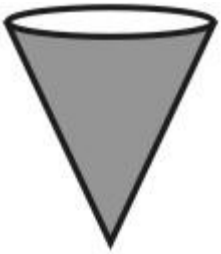
Overall	A: 8.0%	B: **26.6%**	C: 15.7%	D: 48.6%	Invalid Answer: 0.6%	Not Attempted: 0.5%

Question no: 33

Skill: Basic Shapes, Geometry and Visual estimation**Paper Set: A, Medium: English**

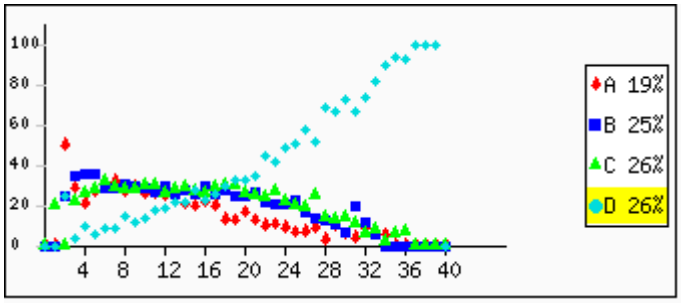
Which of these is a triangle?

A:

B: 

C:

D:

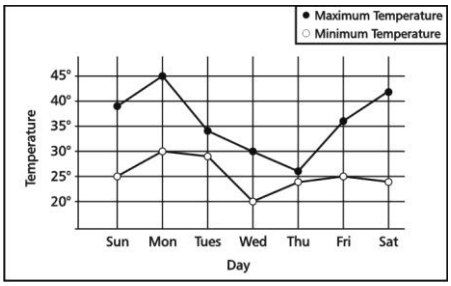


Overall	A: 19.7%	B: 25.8%	C: 26.8%	D: **26.6%**	Invalid Answer: 0.4%	Not Attempted: 0.7%

Question no: 34

Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

Shown below is the graph representing the highest and the lowest temperature recorded in a day for a week. Study it and answer the question.



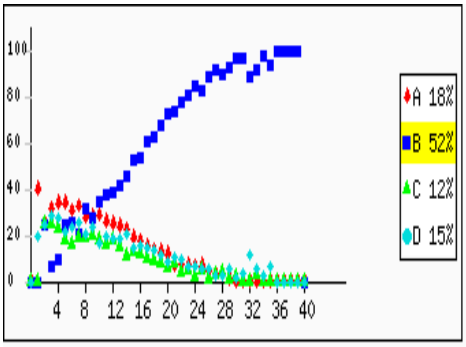
On which day of the week was the HIGHEST temperature recorded?

A: Sunday

B: Monday

C: Wednesday

D: Saturday



Overall	A: 18.7%	B: **52.5%**	C: 12.2%	D: 15.5%	Invalid Answer: 0.3%	Not Attempted: 0.8%

Question no: 35

Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

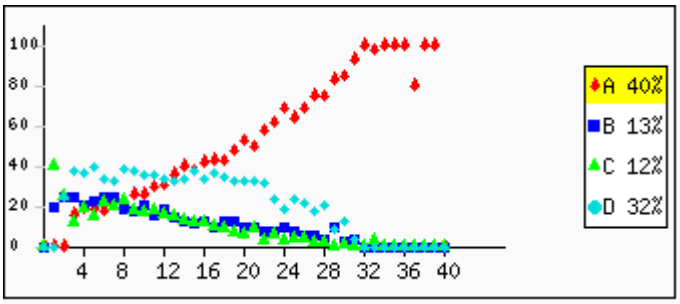
Rahul is older than Ramesh and Ramesh is older than Peter.
Which statement must be true?

A: Rahul is older than Peter.

B: Rahul is younger than Peter.

C: Rahul is the same age as Peter.

D: We cannot tell who is the oldest from the information.



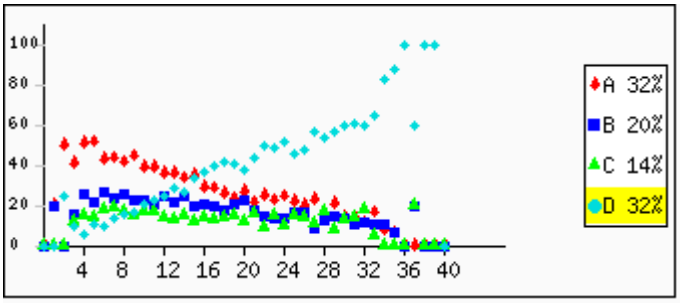
Overall	A: **40.6%**	B: 13.7%	C: 12.5%	D: 32.1%	Invalid Answer: 0.3%	Not Attempted: 0.8%

Question no: 36

Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

Rahul's father is 6 times as old as Rahul. Rahul's mother is 25 years old. The average age of this family of three is 20 years. How old is Rahul?

A: 15 years
B: 10 years
C: 7 years
D: 5 years

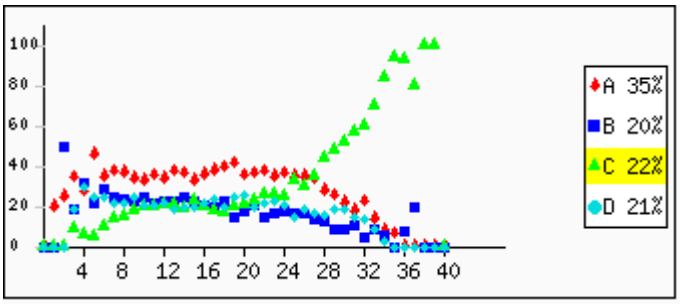


Overall	A: 32.1%	B: 20.4%	C: 14.4%	D: **32.2%**	Invalid Answer: 0.5%	Not Attempted: 0.5%

Question no: 37

Skill: Reasoning and Problem Solving (Advanced or challenging problems)**Paper Set: A, Medium: English**

A sheet of paper is 0.012 cm thick. What would be the height of a stack of 400 sheets of this paper?
A: 0.048 cm
B: 0.48 cm
C: 4.8 cm
D: 48 cm

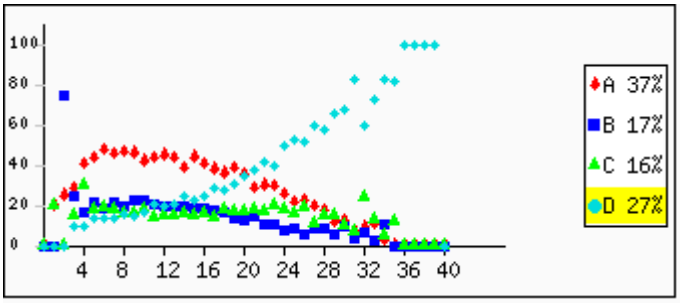


Overall	A: 35.1%	B: 20.6%	C: **22.1%**	D: 21.0%	Invalid Answer: 0.4%	Not Attempted: 0.8%

Question no: 38

Skill: Reasoning and Problem Solving (Advanced or challenging problems)**Paper Set: A, Medium: English**

Observe the number pattern in the number triangle above. If it is extended, what will be the last number (on the right) in the **9th row**?
A: 25
B: 36
C: 61
D: 81

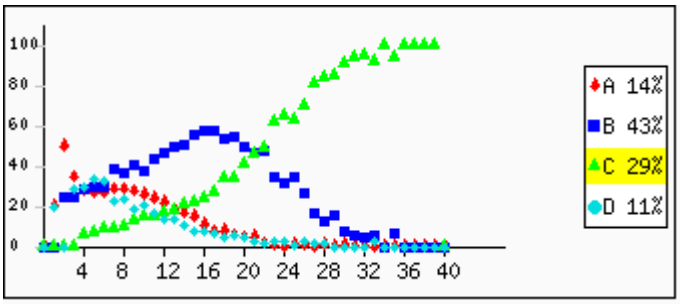


Overall	A: 37.7%	B: 17.0%	C: 16.4%	D: **27.6%**	Invalid Answer: 0.5%	Not Attempted: 0.8%

Question no: 39

Skill: Number sense, related concepts and basic number competency**Paper Set: A, Medium: English**

7^2 =
A: 7
B: 14
C: 49
D: 72

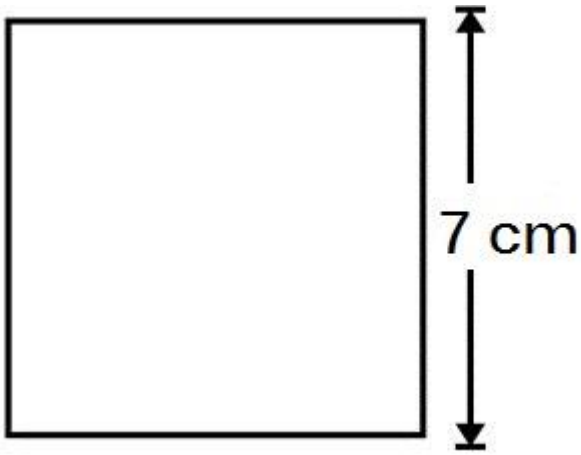


Overall	A: 14.5%	B: 43.8%	C: **29.6%**	D: 11.1%	Invalid Answer: 0.4%	Not Attempted: 0.7%

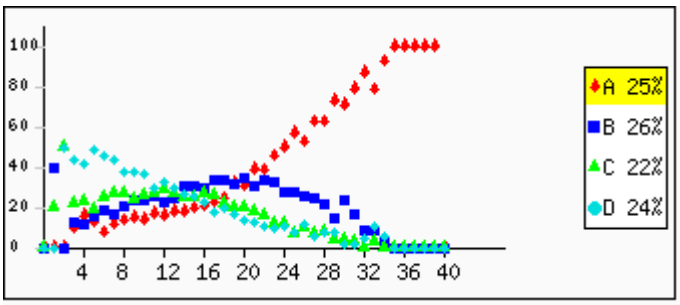
Question no: 40

Skill: Mensuration - Area and Perimeter, Volume and Surface Area**Paper Set: A, Medium: English**

What is the area of the **square** shown below?



A: 49 cm^2
B: 28 cm^2
C: 14 cm^2
D: 7 cm^2



Overall	A: **25.5%**	B: 26.5%	C: 22.7%	D: 24.7%	Invalid Answer: 0.3%	Not Attempted: 0.3%

Note: For each question, options marked with RED letters shows % of students who gave wrong answers, options marked with GREEN letters shows % of students who gave correct answers.