



Young Lives 2016-17 School Surveys

Item level analysis

Vietnam

Wave 2

Subject: Mathematics

This booklet contains Maths items administered to students in Grade 10 at Wave 2 of Young Lives' school survey in Vietnam. 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 Iyer et al, 2017. Young Lives School Survey, 2016–17: Evidence from Vietnam.

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Question no: 1

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

The table below shows the relationship between the x and y .

x	2	3	4	5
y	4	7	10	13

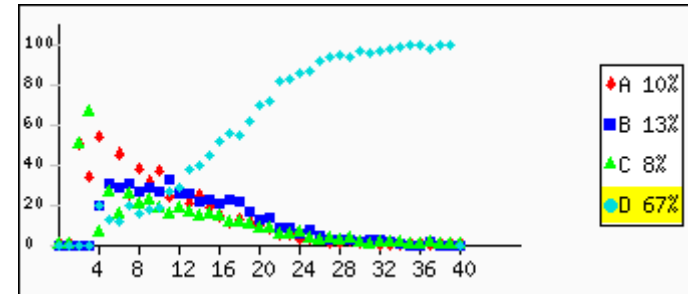
Which of these equations expresses this relation?

A: $y = 2x + 2$

B: $y = x + 2$

C: $y = 4x - 4$

D: $y = 3x - 2$



Overall

A: 10.7%

B: 13.3%

C: 8.7%

D: 67.1%

Invalid Answer: 0.0%

Not Attempted: 0.3%

Question no: 2

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

Δ is a common factor of 3 numbers X, Y and Z.

Shown below are the prime factorisations of X, Y and Z.

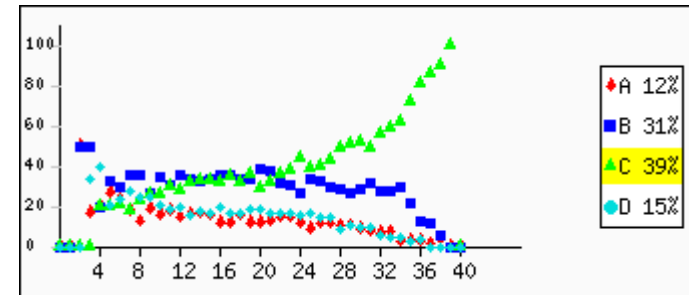
$$X = 2 \times 3 \times 5 \times \Delta$$

$$Y = 2 \times 2 \times 3 \times 3 \times 5 \times \Delta$$

$$Z = 2 \times 2 \times 2 \times 3 \times 3 \times \Delta$$

Which of the following is DEFINITELY a factor of the sum $X + Y + Z$?

- A: 4
- B: 5
- C: 6
- D: 9

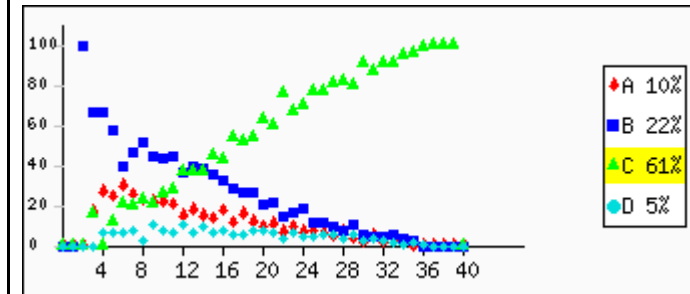


Overall	A: 12.1%	B: 31.2%	C: 40.0%	D: 15.0%	Invalid Answer: 0.0%	Not Attempted: 1.7%
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Question no: 3Skill: Basic Shapes, Geometry and Visual estimation **Paper Set: A, Medium: English**

Megha takes tablet A every 4 hours and tablet B every 6 hours. How often will she take both the medicines at the same time?

- A: every 2 hours
 B: every 10 hours
 C: every 12 hours
 D: every 16 hours



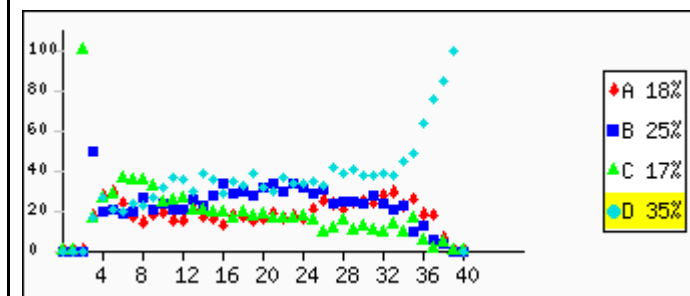
Overall	A: 10.4%	B: 22.1%	C: 61.8%	D: 5.5%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 4Skill: Integers and Rational numbers, Powers and Bases **Paper Set: A, Medium: English**

Numbers that can be written in the form $\frac{m}{n}$ where m and n are integers and n is not equal to 0 are called rational numbers.

Which of the numbers in the list below are rational numbers?

- A: only -252 and 1
 B: only -252 and 0.3310
 C: only -252, 0.3333.... (recurring) and 1
 D: All of them are rational numbers.



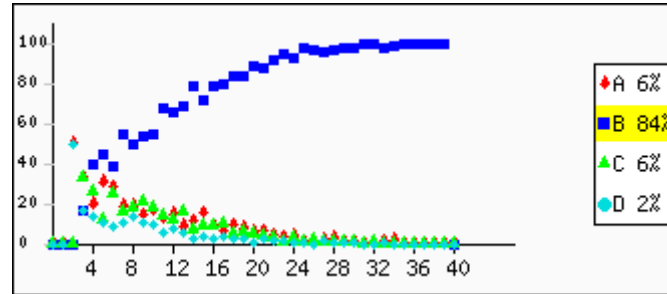
Overall	A: 18.6%	B: 25.9%	C: 17.2%	D: 35.9%	Invalid Answer: 0.0%	Not Attempted: 2.4%
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Question no: 5

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

$-4 - (-5) = \dots\dots\dots$

- A: -1
- B: 1
- C: -9
- D: 9



Overall	A: 6.7%	B: 84.4%	C: 6.1%	D: 2.8%	Invalid Answer: 0.0%	Not Attempted: 0.1%
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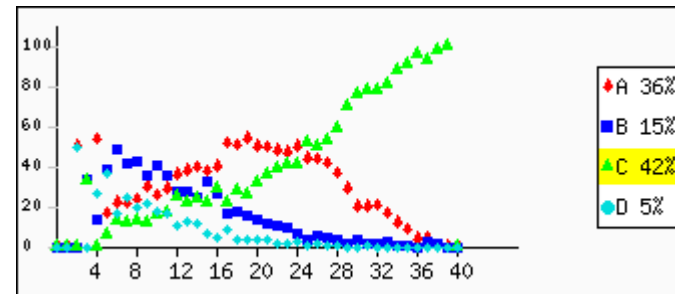
Question no: 6

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

Which of these numbers are equal?

1^{119}	119^1	119^0	1^1
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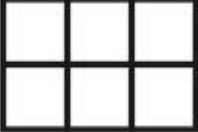
- A: only 1^{119} and 1^1
- B: only 1^{119} and 119^1
- C: only 1^{119} , 119^0 and 1^1
- D: None of them are equal.

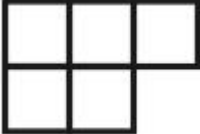


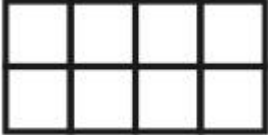
Overall	A: 36.3%	B: 15.3%	C: 42.5%	D: 5.5%	Invalid Answer: 0.0%	Not Attempted: 0.5%
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Question no: 7

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

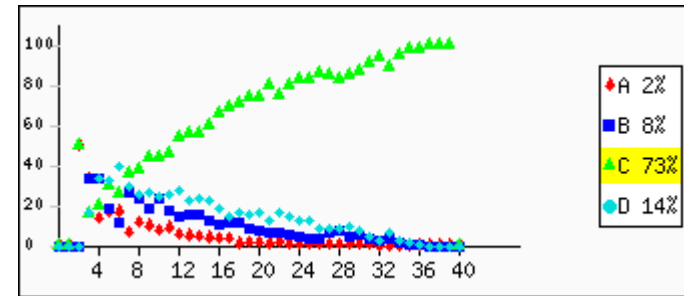
If  represents 75%, which of the following represents 125%?

A: 

B: 

C: 

D: 

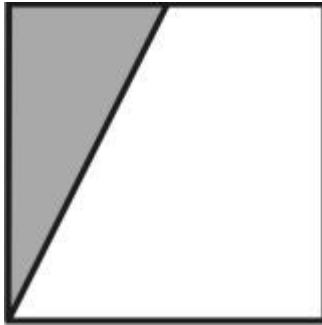


Overall	A: 2.5%	B: 9.0%	C: 73.1%	D: 14.9%	Invalid Answer: 0.0%	Not Attempted: 0.5%
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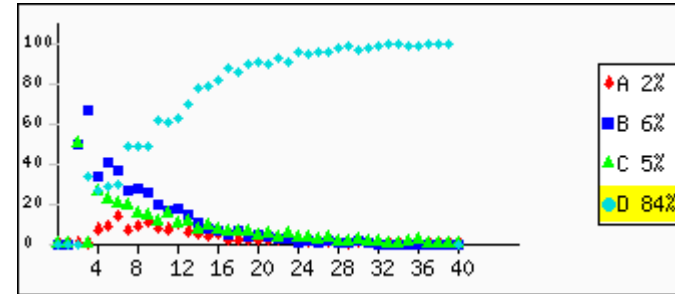
Question no: 8

Skill: Algebra: concepts and applications 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: 2.6%	B: 6.5%	C: 5.8%	D: 84.9%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 9

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

0.5 is the same as -

i) 5% of 10

ii) 10% of 5

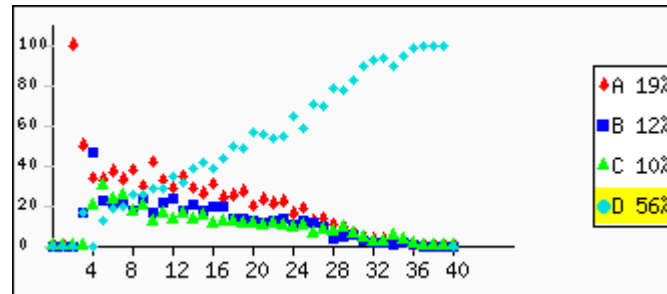
iii) 50% of 1

A: only (i)

B: only (ii)

C: both (i) and (ii)

D: all - (i), (ii) and (iii)

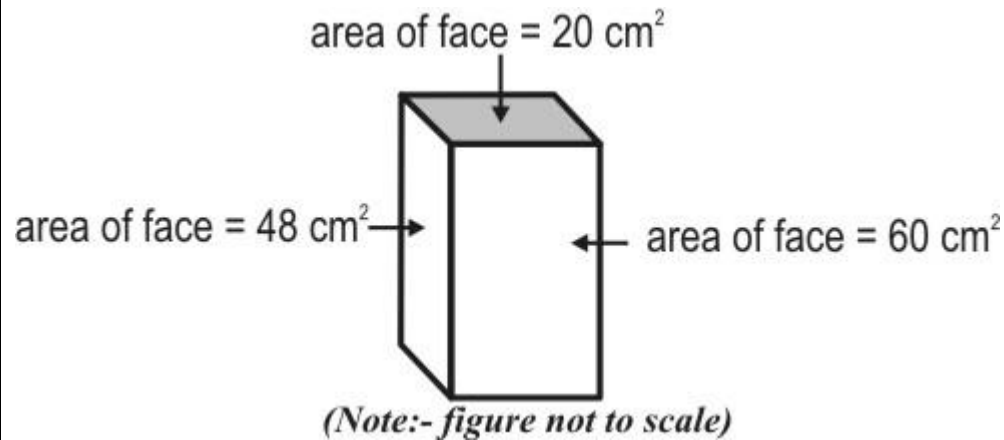


Overall	A: 20.0%	B: 12.5%	C: 10.5%	D: 56.6%	Invalid Answer: 0.0%	Not Attempted: 0.5%
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Question no: 10

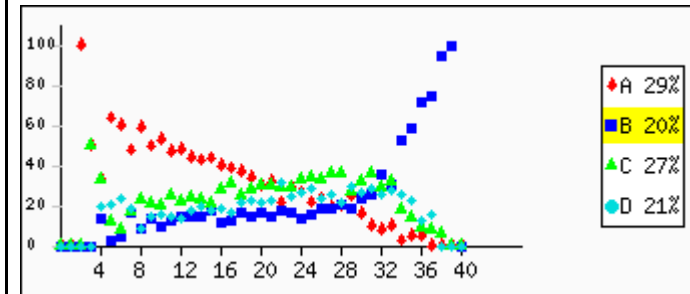
Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

3 of the different faces of a cuboidal box have surface areas 20 cm^2 , 48 cm^2 , and 60 cm^2 respectively.



What is the volume of the cuboidal box?

- A: 128 cm^3
- B: 240 cm^3
- C: 256 cm^3
- D: 57600 cm^3

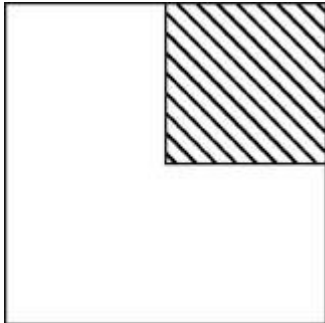


Overall	A: 29.9%	B: 20.2%	C: 27.1%	D: 21.7%	Invalid Answer: 0.0%	Not Attempted: 1.1%
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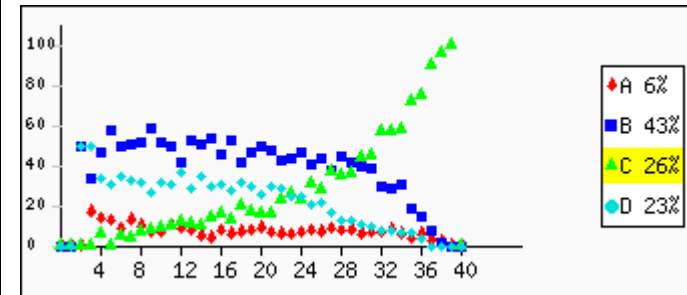
Question no: 11

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

What will happen to the perimeter of the larger square if the shaded part is cut out of it?



- A: It will increase.
- B: It will reduce.
- C: It will stay the same.
- D: It depends on the size of the square.

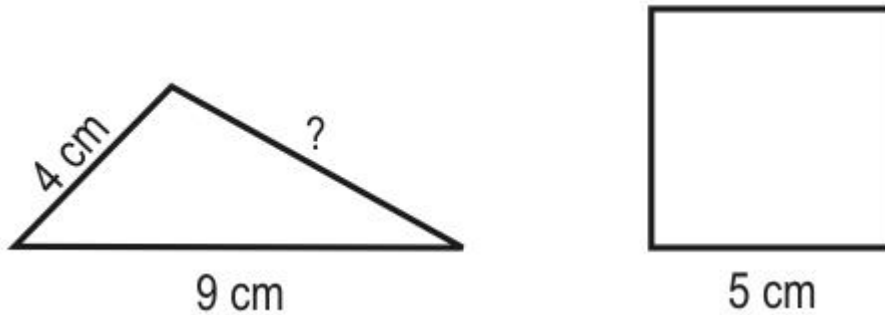


Overall	A: 6.8%	B: 43.3%	C: 26.5%	D: 23.2%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 12

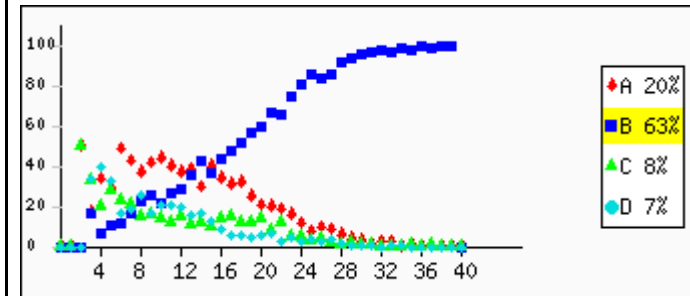
Skill: Mensuration - Area and Perimeter, Volume and Surface Area **Paper Set: A, Medium: English**

Shown here is a triangle with two of its sides as 9 cm and 4 cm and a square of side 5 cm.



Both the figures have the same perimeter. What would be the length of the third side of the triangle?

- A: 5 cm
- B: 7 cm
- C: 8 cm
- D: 13 cm



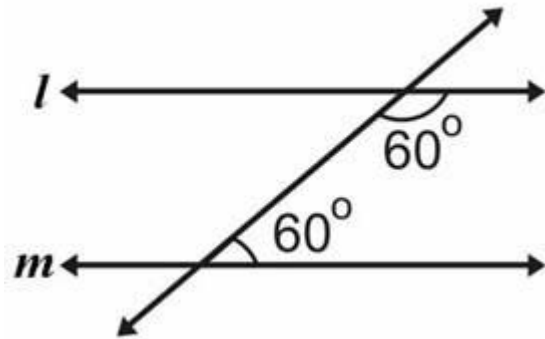
Overall	A: 20.3%	B: 63.6%	C: 8.4%	D: 7.3%	Invalid Answer: 0.0%	Not Attempted: 0.4%
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Question no: 13

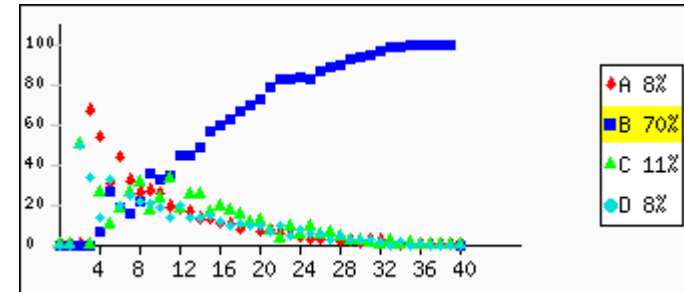
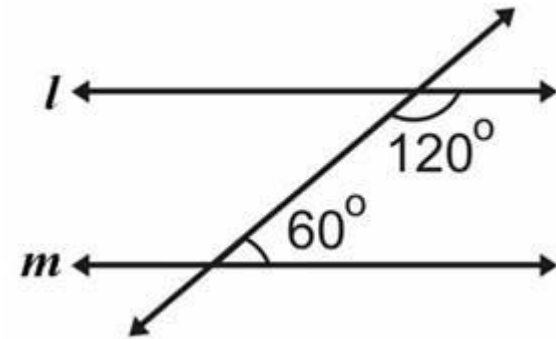
Skill: Basic Shapes, Geometry and Visual estimation **Paper Set: A, Medium: English**

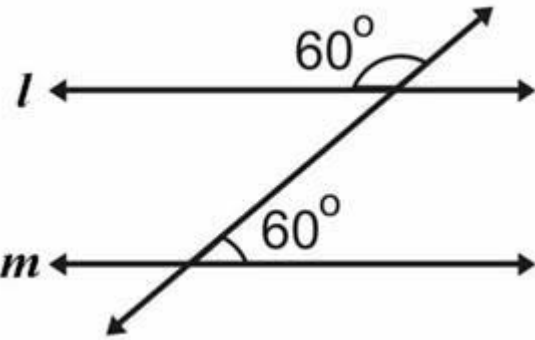
Lines l and m are parallel. Which figure shows the correct angle measurement?

A:

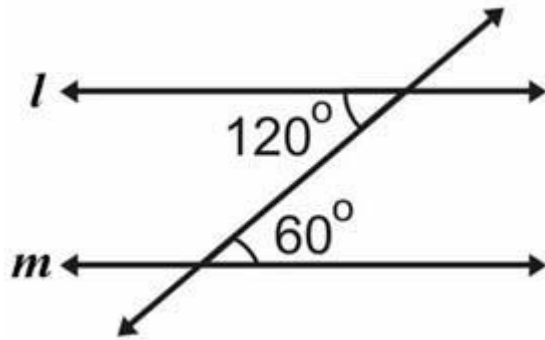


B:





C:



D:

Overall	A: 8.7%	B: 70.9%	C: 11.5%	D: 8.7%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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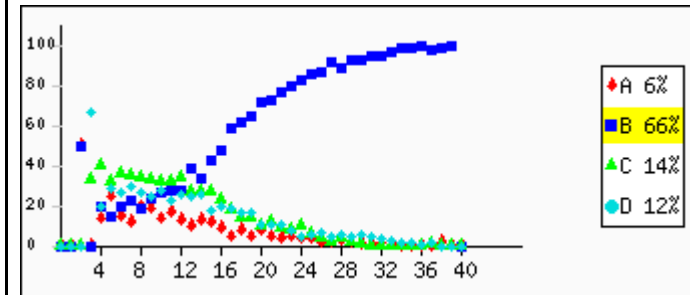
Question no: 14

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

Anupam draws a triangle whose three sides are of length 5 cm each. He finds that all the three angles of the triangle measure 60° each.

Now he draws a triangle all of whose sides are 10 cm each. Which of these is true about the three angles of this triangle?

- A: All the three angles will measure 30° each.
- B: All the three angles will measure 60° each.
- C: All the three angles will measure 120° each.
- D: (We cannot say anything without measuring the angles.)

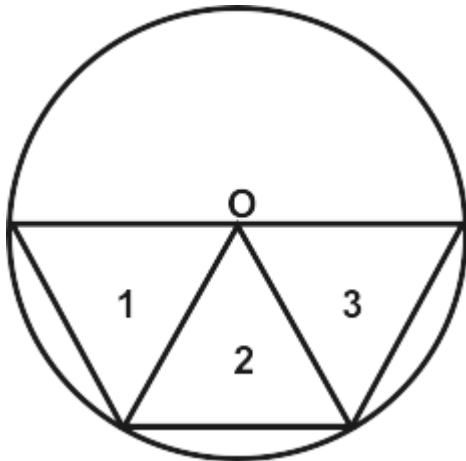


Overall	A: 6.2%	B: 66.6%	C: 14.1%	D: 12.8%	Invalid Answer: 0.0%	Not Attempted: 0.4%
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Question no: 15

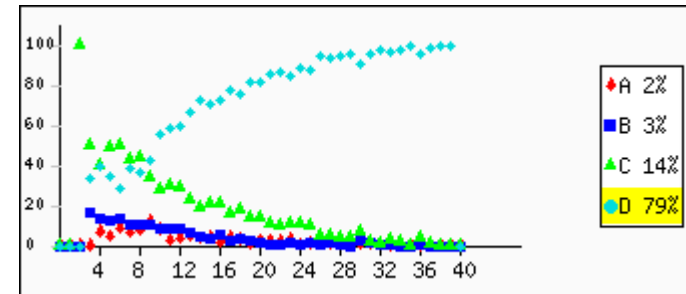
Skill: Basic Shapes, Geometry and Visual estimation **Paper Set: A, Medium: English**

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

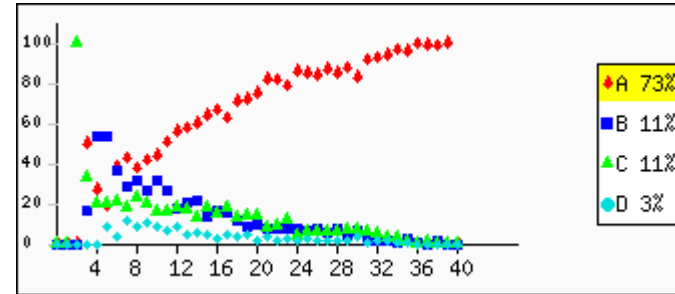


Overall	A: 2.2%	B: 3.2%	C: 14.6%	D: 79.8%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 16

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

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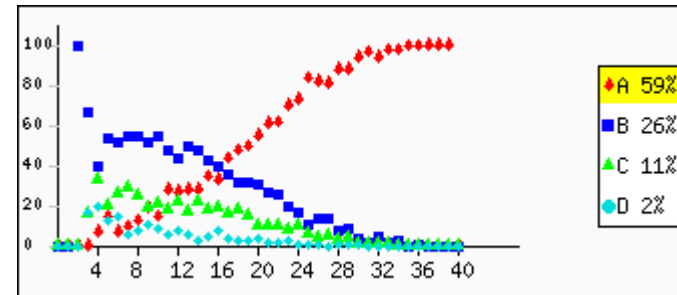
Overall	A: 73.6%	B: 11.8%	C: 11.0%	D: 3.4%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 17

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

The subtraction of $\overrightarrow{OM} - \overrightarrow{ON}$ is:

- A: \overrightarrow{NM}
- B: \overrightarrow{MN}
- C: $|\overrightarrow{MN}|$
- D: MN

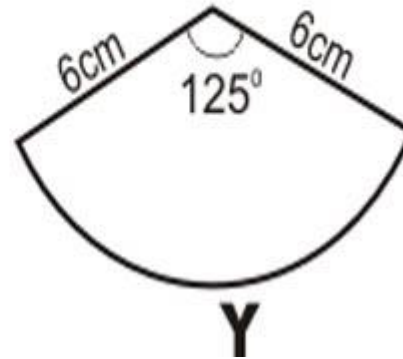
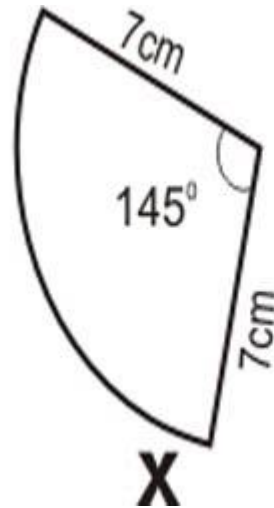


Overall	A: 59.0%	B: 26.1%	C: 11.5%	D: 2.9%	Invalid Answer: 0.0%	Not Attempted: 0.5%
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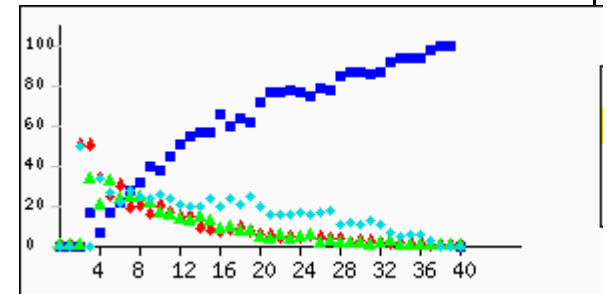
Question no: 18

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

Of the pieces shown here, which two could form a semicircle when placed next to each other with their edges touching?



- A: Z and W
- B: W and Y
- C: Y and Z
- D: Z and X



Overall	A: 6.9%	B: 68.7%	C: 7.0%	D: 17.1%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 19

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

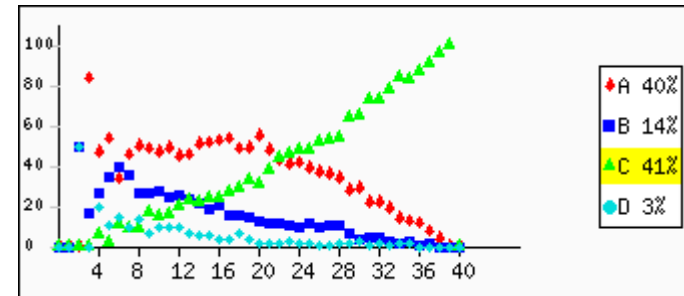
Line (d) passes point A (4;5) with the perpendicular vector $\vec{h} = (2;1)$.
The parametric equation of (d) is:

A:
$$\begin{cases} x = 4 + 2t \\ y = 5 + t \end{cases}$$

B:
$$\begin{cases} x = 2 + 4t \\ y = 1 + 5t \end{cases}$$

C:
$$\begin{cases} x = 4 + t \\ y = 5 - 2t \end{cases}$$

D:
$$\begin{cases} x = 2 + 5t \\ y = 1 - 4t \end{cases}$$



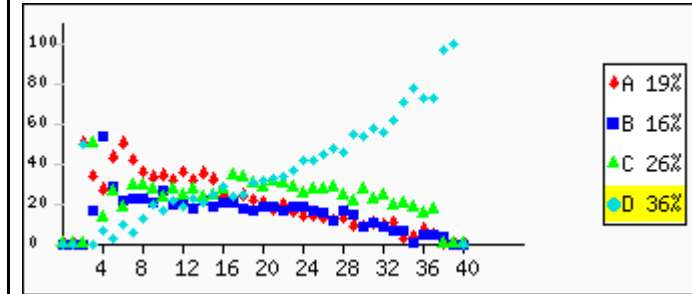
Overall	A: 40.0%	B: 14.1%	C: 41.9%	D: 3.7%	Invalid Answer: 0.0%	Not Attempted: 0.4%
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Question no: 20

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

Given is a circle (C) with the center I (3 ; -4), the radius R = 5. The equation of circle (C) is:

- A: $(X + 3)^2 + (Y - 4)^2 = 5$
- B: $(X - 3)^2 + (Y + 4)^2 = 5$
- C: $(X + 3)^2 + (Y - 4)^2 = 25$
- D: $(X - 3)^2 + (Y + 4)^2 = 25$



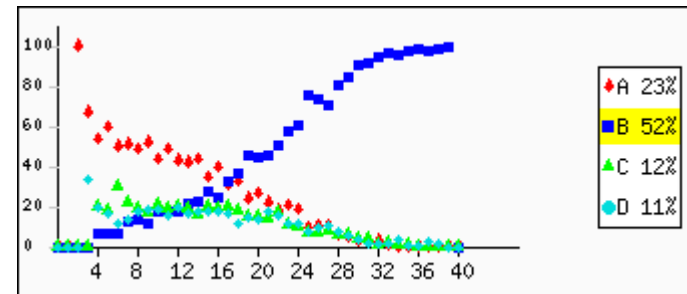
Overall	A: 19.8%	B: 16.4%	C: 26.1%	D: 36.7%	Invalid Answer: 0.0%	Not Attempted: 1.1%
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Question no: 21

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

Given are 3 random points M, N, P . Which following answer equals to \vec{MN} ?

- A: $\vec{MP} + \vec{NP}$
- B: $\vec{PN} - \vec{PM}$
- C: $\vec{MP} - \vec{PN}$
- D: $\vec{PM} - \vec{PN}$



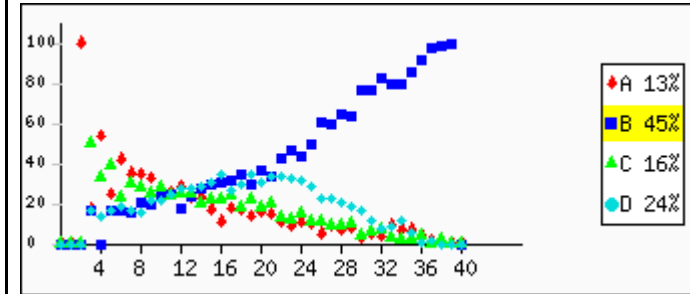
Overall	A: 23.1%	B: 52.1%	C: 12.7%	D: 11.9%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 22

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

The given statement " $\forall \in \mathbb{R}, X^2 - 2X + 4 > 0$ ". Which statement is the negative clause of the mentioned clause?

- A: " $\forall \in \mathbb{R}, X^2 - 2X + 4 \leq 0$ "
- B: " $\exists \in \mathbb{R}, X^2 - 2X + 4 \leq 0$ "
- C: " $\exists \in \mathbb{R}, X^2 - 2X + 4 > 0$ "
- D: " $\exists \in \mathbb{R}, X^2 - 2X + 4 < 0$ "



Overall	A: 14.0%	B: 45.1%	C: 16.2%	D: 24.2%	Invalid Answer: 0.0%	Not Attempted: 0.5%
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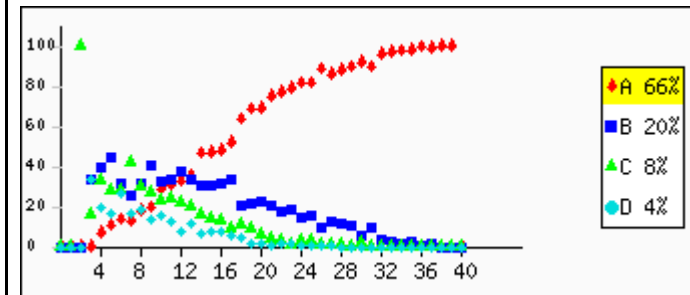
Question no: 23

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

In a vase, there are 6 times as many roses as lilies.

If R stands for the number of roses and L stands for the number of lilies, which of the following equations describes the above statement?

- A: $R = 6L$
- B: $6R = L$
- C: $R = L + 6$
- D: $6R = 6L$

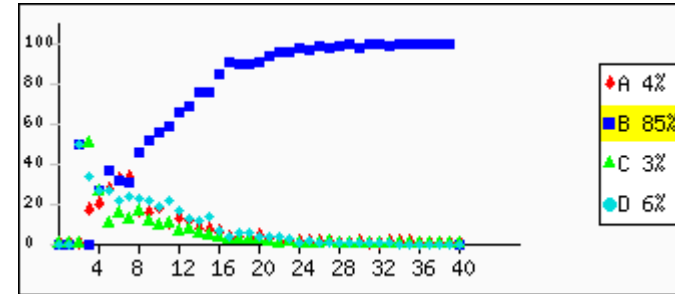


Overall	A: 66.5%	B: 20.0%	C: 8.9%	D: 4.3%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 24

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

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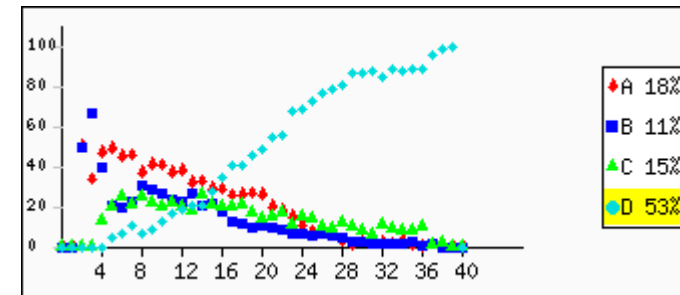
Overall	A: 4.7%	B: 85.9%	C: 3.0%	D: 6.3%	Invalid Answer: 0.0%	Not Attempted: 0.1%
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Question no: 25

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

Which following point belongs to the line representing $y = -3x + 1$?

- A: (1; 0)
- B: (-2; 5)
- C: (-2; -5)
- D: (-2; 7)



Overall	A: 19.0%	B: 11.6%	C: 15.6%	D: 53.2%	Invalid Answer: 0.0%	Not Attempted: 0.7%
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Question no: 26

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

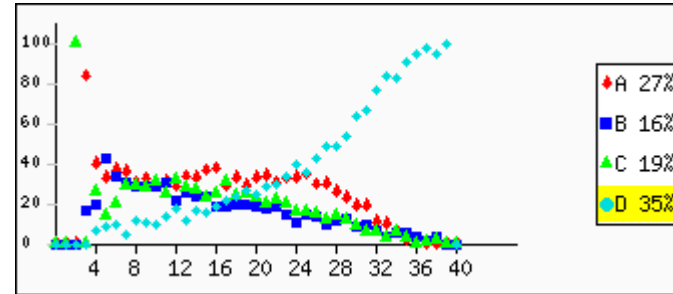
Which of the following polynomials has a factor $(m + n)$?

A: $m^2 + n^2$

B: $(m - n)^2$

C: $m^2 + mn + n^2$

D: $-km - kn - (m + n)$

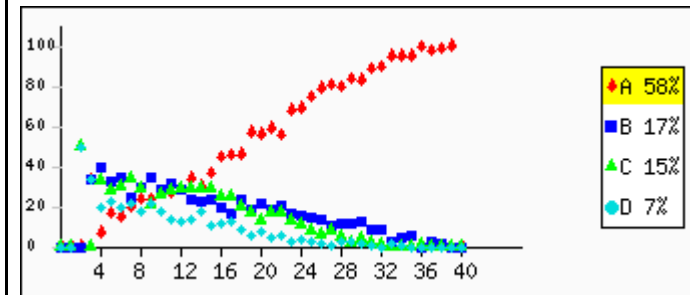


Overall	A: 27.5%	B: 17.0%	C: 19.3%	D: 35.9%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 27

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

This redacted item is not for public release.



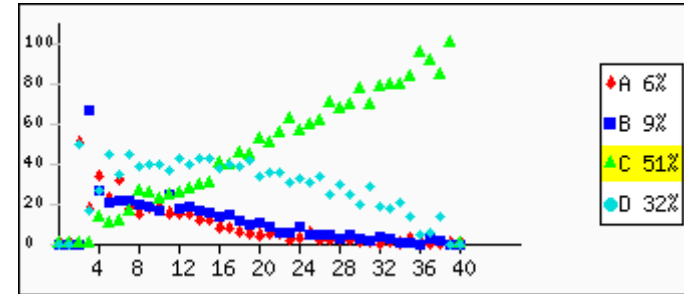
Overall	A: 58.7%	B: 17.8%	C: 15.5%	D: 7.2%	Invalid Answer: 0.0%	Not Attempted: 0.7%
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Question no: 28

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.



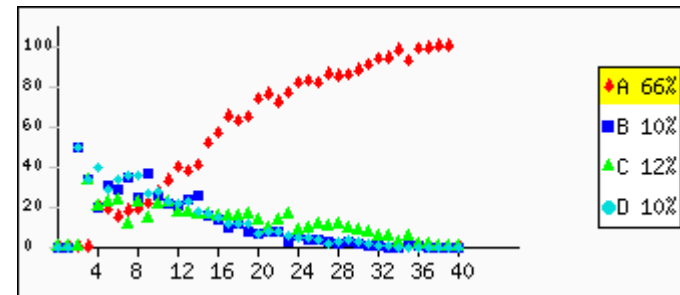
Overall	A: 6.3%	B: 9.7%	C: 51.1%	D: 32.6%	Invalid Answer: 0.0%	Not Attempted: 0.4%
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Question no: 29

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

$y + 10 < 10$. Which of these is DEFINITELY true?

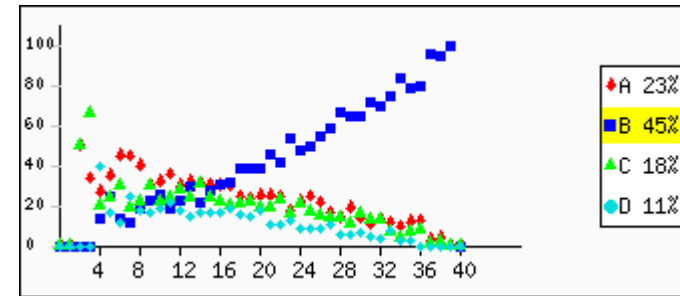
- A: y is any negative number.
- B: y is a positive number less than 10.
- C: y has to be a negative number less than -10.
- D: $y + 10$ cannot be less than 10 for any value of y .



Overall	A: 66.6%	B: 10.1%	C: 12.6%	D: 10.5%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 30Skill: Reasoning and Problem Solving (Advanced or challenging problems) **Paper Set: A, Medium: English**The coordinates of I of parabola (P): $y = -x^2 - 2x + 5$ is:

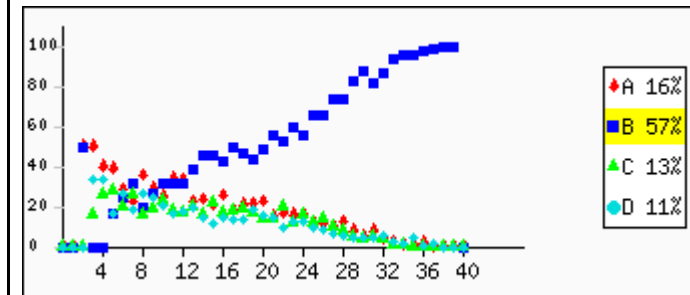
- A: I (-2 ; 5)
 B: I (-1 ; 6)
 C: I (1 ; 2)
 D: I (2 ; - 3)



Overall	A: 23.3%	B: 45.3%	C: 18.9%	D: 11.9%	Invalid Answer: 0.0%	Not Attempted: 0.6%
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Question no: 31Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**The line representing $y = 3x + 2$ will intersect with the line representing which equation?

- A: $y = 3x$
 B: $y = -3x + 4$
 C: $y = 3x + 5$
 D: $y = 3x - 1$



Overall	A: 16.9%	B: 57.1%	C: 13.7%	D: 12.0%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 32

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

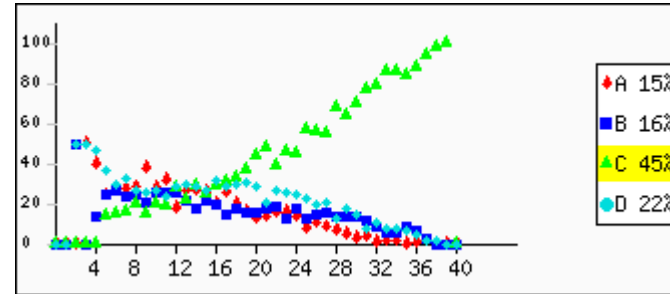
The set of the roots of inequation $x^2 - x - 6 < 0$ is:

A: $(-\infty; -3) \cup (2; +\infty)$

B: $(-3; 2)$

C: $(-2; 3)$

D: $(-\infty; -2) \cup (3; +\infty)$



Overall	A: 15.1%	B: 16.2%	C: 46.0%	D: 22.5%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 33

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

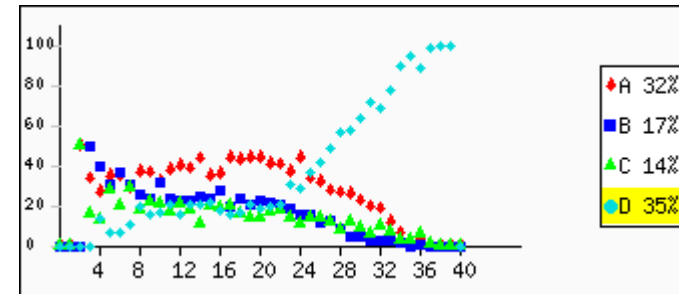
Equation $x^2 - 2x + m - 1 = 0$ has roots when and only when:

A: $m \geq 2$

B: $m > 2$

C: $m < 2$

D: $m \leq 2$

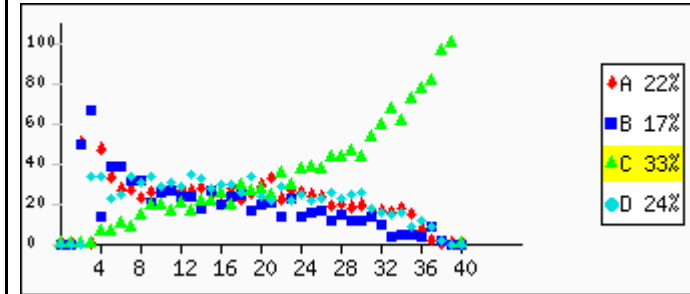


Overall	A: 32.7%	B: 17.0%	C: 14.4%	D: 35.3%	Invalid Answer: 0.0%	Not Attempted: 0.6%
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Question no: 34

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

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Overall	A: 22.8%	B: 17.7%	C: 33.8%	D: 25.0%	Invalid Answer: 0.0%	Not Attempted: 0.7%
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Question no: 35

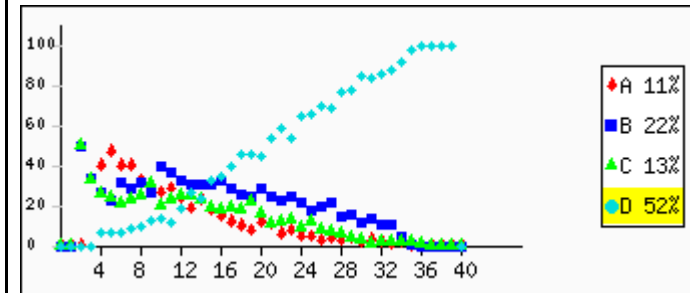
Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

A group of 10 friends have some marbles with them.

If they had 3 more marbles, they would be able to distribute the marbles equally amongst themselves.

Which of these could be the number of marbles they had?

- A: 13
- B: 20
- C: 33
- D: 47

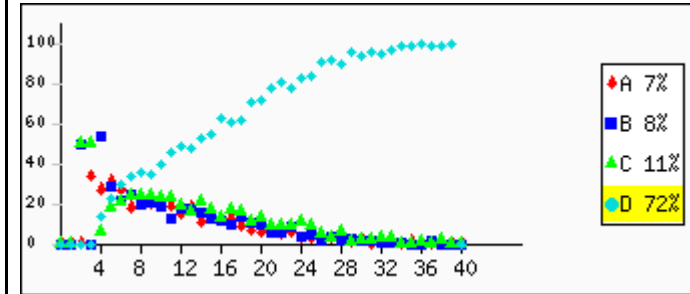


Overall	A: 11.1%	B: 22.7%	C: 13.8%	D: 52.1%	Invalid Answer: 0.0%	Not Attempted: 0.3%
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Question no: 36Skill: Applications in daily life, commercial Maths, word and visual problems **Paper Set: A, Medium: English**

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

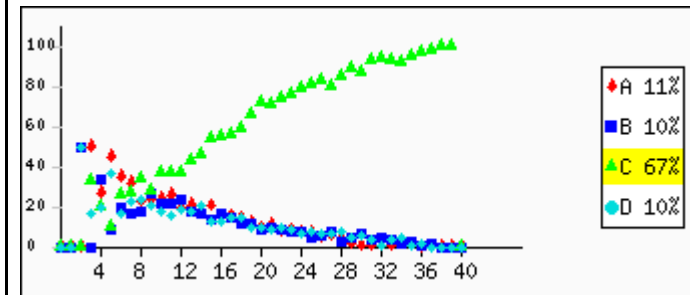


Overall	A: 7.6%	B: 8.5%	C: 11.3%	D: 72.0%	Invalid Answer: 0.0%	Not Attempted: 0.6%
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Question no: 37Skill: Algebra: concepts and applications **Paper Set: A, Medium: English**

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

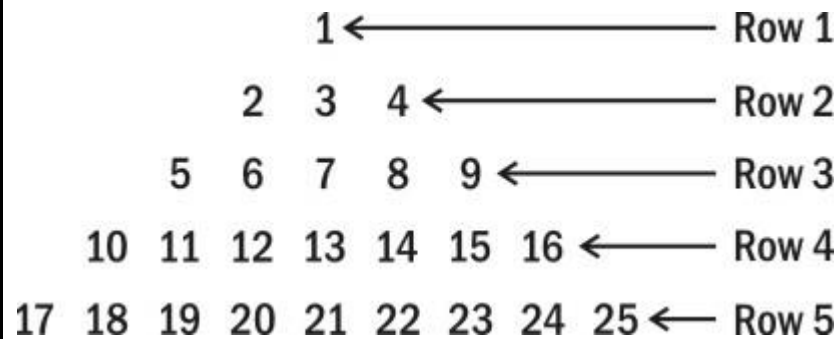


Overall	A: 11.1%	B: 10.5%	C: 67.4%	D: 10.4%	Invalid Answer: 0.0%	Not Attempted: 0.6%
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Question no: 38

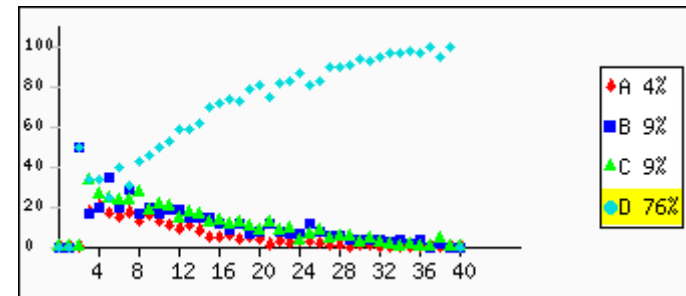
Skill: Reasoning and Problem Solving (Advanced or challenging problems) Paper Set: A, Medium: English

Observe the number pattern in the number triangle below.



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

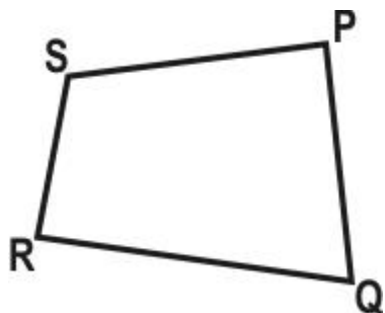


Overall	A: 4.2%	B: 9.7%	C: 9.8%	D: 76.1%	Invalid Answer: 0.0%	Not Attempted: 0.2%
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Question no: 39

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

A field PQRS is in the shape of a quadrilateral.

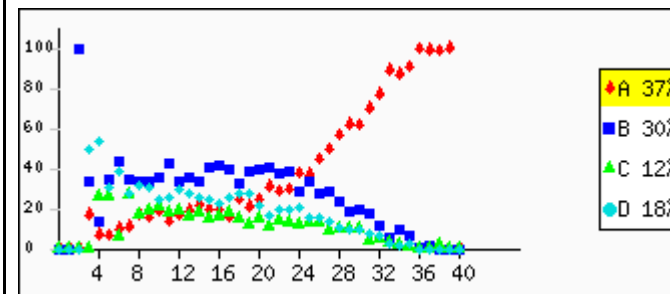


(Note: Figure not to scale.)

If you walked from Q to P to S to R along the boundary of the field, you would have covered 140 metres. If you walked from P to S to R to Q along the boundary of the field, you would have covered 135 metres.

Based on this, which of the following can you conclude?

- A: PQ is 5 m longer than QR
- B: QR is 5 m longer than SR
- C: PS is 5 m longer than PQ
- D: the perimeter of the field is 275 m



Overall	A: 37.5%	B: 30.2%	C: 12.9%	D: 18.8%	Invalid Answer: 0.0%	Not Attempted: 0.6%
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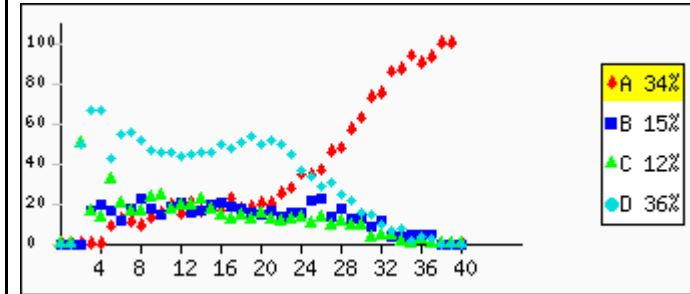
Question no: 40

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

80 girls and 100 boys appeared for the class 10 board exam from Pratibha School. 25% of the girls and 10% of the boys who appeared got A grades.

What percentage of the total number of students who appeared got A grades?

- A: 16.70%
- B: 17.50%
- C: 25%
- D: 35%



Overall	A: 34.6%	B: 15.3%	C: 12.8%	D: 37.0%	Invalid Answer: 0.0%	Not Attempted: 0.4%
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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.