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மேல் மாகாணகல்விதிணைக்களம்
Western Provincial Education Department

දෙවන වාර ඇගයීම - 2018
இரண்டாம் வதுதவணைமதிப்பீடு - 2018
Second Term Evaluation - 2018

11 ශ්‍රේණිය
தரம் 11
Grade 11

ගණිතය 1 පත්‍රය
கணிதவினாதாள் - 1
Mathematics Paper - I

පැය දෙකයි
இரண்டுமணிநேரம்
Two Hours

Name/ Index No -----

Signature of Invigilator

Important:

- This paper consist of 8 pages
- Write your **index no** correctly in the appropriate place on the **page one** and **page three**.
- Answer all questions **on this paper itself**.
- Use the space provided under each question for working and writing the answer.
- It is necessary to write relevant steps and correct units.
- Marks will be awarded follows :
02 marks each for questions 1 – 25 in part A
10 marks each for questions in part B.

For marking examiner's use only

Question number		Marks
A	1 - 25	
B	1	
	2	
	3	
	4	
	5	
Total		

.....
Marked by

Part A

Answer all the questions on this paper itself.

1. If the annual rates that should be paid for a house with the annual assessed value of Rs. 60 000 is Rs. 2 400, how much should be paid for a quarter?

2. The area of the curved surface of a cylinder with the total surface area of $1\ 188\text{cm}^2$ is 880cm^2 . The area of the base of it is,

i. 308cm^2

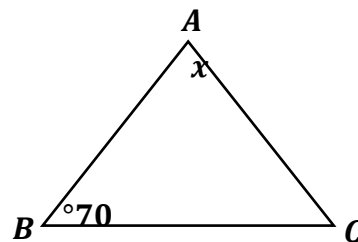
ii. 154cm^2

iii. 616cm^2

3. Find the 8th term of the Geometric progression 3, 6, 12,($2^7 = 128$)

4. Factorize. $x^2 - 4x - 21$

5. In the triangle ABC, $AB = AC$. Find the value of x .



6. 5 men take 4 days to complete half of a certain work. How many mandays are there in the total work?

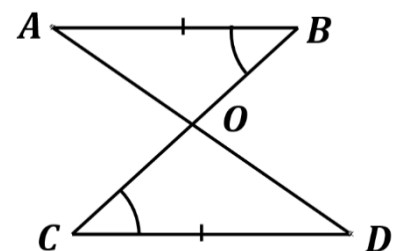
7. Simplify. $\frac{y}{3} \div \frac{4y}{x}$

8. The triangles ABO and COD are congruent under A. A. S case. Write the remaining step to show that they are congruent.

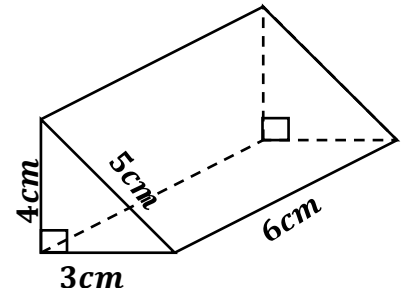
$AB = CD$ (Given)

$\hat{A}BO = \hat{O}CD$ (Given)

..... =(.....)



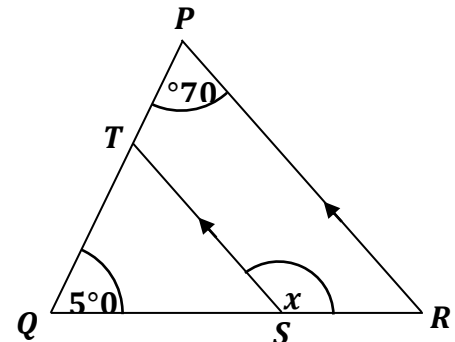
9. Draw sketches of two faces of the given triangular prism with relevant measurements, except the triangular faces.



10. $S = \{ x ; x \text{ is a multiple of } 7, 0 < x < 30 \}$ Describe this set in another method.

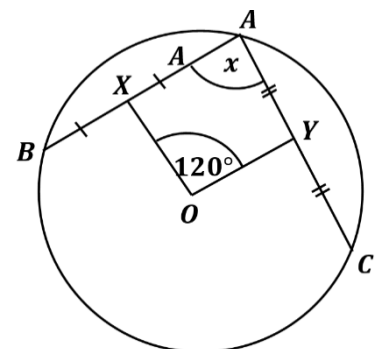
11. Find the least common multiple of the given algebraic terms. $x^2, 2xy, 3y$

12. In the figure, $PR \parallel ST$. If $\angle PQR = 50^\circ$ and $\angle QPR = 70^\circ$, find the value of x .

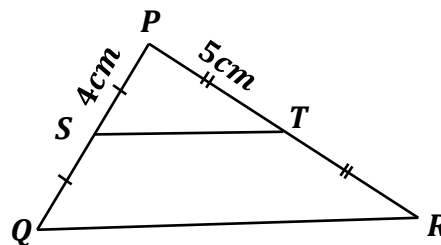


13. What is the smallest positive integer which satisfy the inequality $3x - 1 \geq 5$?

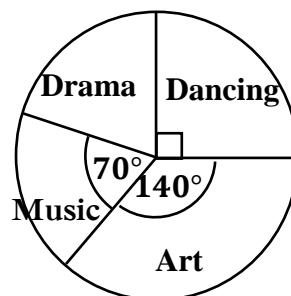
14. In the circle with the center O, AB and AC are two chords. The mid points of AB and AC are X and Y respectively. If $\angle XOY = 120^\circ$, find the magnitude of $\angle BAC$.



15. If the perimeter of the triangle PQR is 28cm, find the length of the side ST.

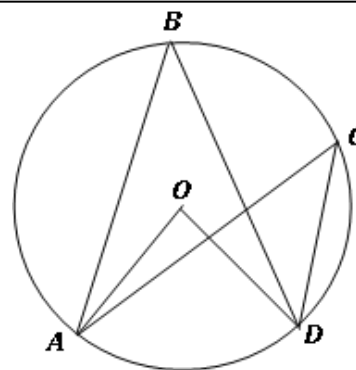


16. The pie chart represents a group of grade 11 students who learn art, dancing, music and drama. If the number of students who learn dancing is 45, how many students learn drama?

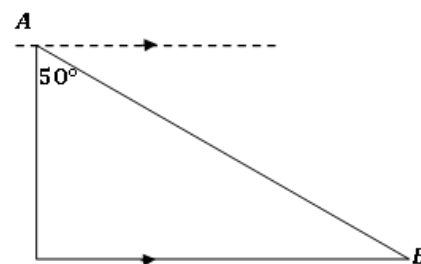


17. Figure shows a circle with the center O. the points A, B, C and D are situated on the circle. Accordingly if the following statements are true put \checkmark and if they are wrong put \times in the given box.

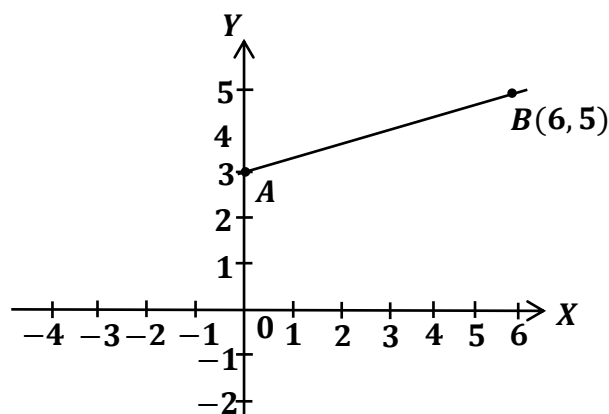
$\widehat{AOD} = 2\widehat{ABD}$	
$\widehat{ABD} = \widehat{ACD}$	



18. According to the information given in the figure, explain the location of B from A with respect to angle of elevation.



19. Find the gradient of the straight line AB shown in the Cartesian plane.

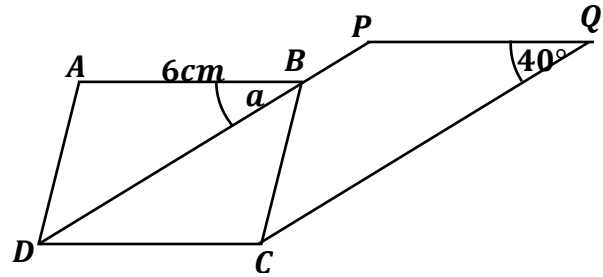


20. ABCD and CDPQ are two parallelograms.

According to the given information, find

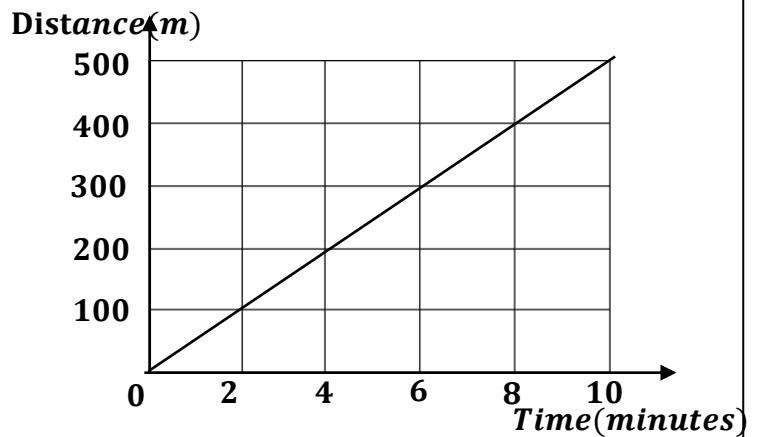
i. PQ length.

ii. Value of a .



21. Express in logarithmic form. $64 = 2^6$

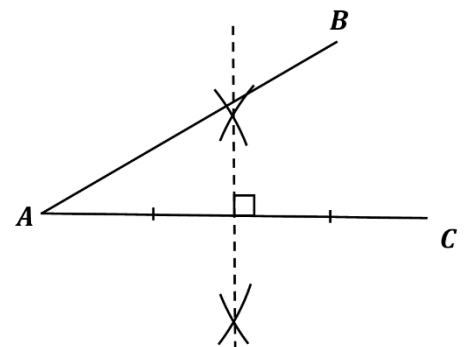
22. The graph illustrates the how Thilina traveled to school from his house. Express his speed in meters per minute.



23. Solve the equation. $(x - 2)(x + 1) = 0$

24. Find the probability of obtaining a number greater than 4, when rolling an unbiased die marked 1 to 6 on its faces.

25. In the figure, AB and AC are two boundaries of a land. A telephone post is needed to be fixed equidistant to the two boundaries and equidistant to A and C. Using the knowledge of loci, mark the relevant location (x) in the figure.



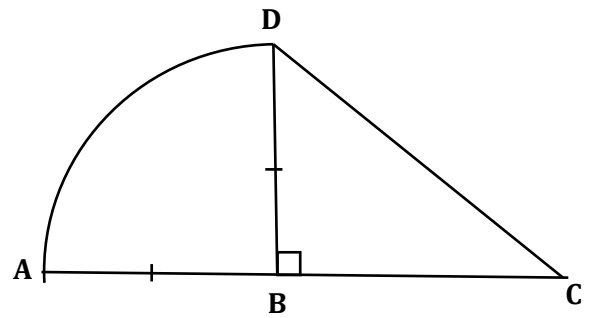
Part B

Answer all the questions on this paper itself.

1. $\frac{1}{8}$ of a water in a tank which is completely filled with water, is used during the morning.
 - i. Express the quantity of water remaining in the tank as a fraction.
 - ii. $\frac{5}{7}$ of the remaining quantity of water is used during the evening. What fraction of the whole quantity of water is used during the evening?
 - iii. If the remaining quantity of water in the tank after that is $250l$, find the capacity of the tank.
 - iv. If the water is supplied to the tank at a uniform rate of 50 litres per minute, how many minutes will it take to fill the tank completely?
 - v. If it is a cubic shaped tank with the area of the base $1m^2$, find the height of the tank.
2. (a) Induwara sold 500 shares that he owned for Rs. 40 000, after having a capital gain of Rs. 4000.
 - i. What is the market price of a share when he is selling it?
 - ii. How much did he invest to buy the shares?
 - iii. At what market price of a share when he is buying it?
 - iv. If the company pays a dividend of Rs. 6 per share, what is the dividend gained by Induwara?

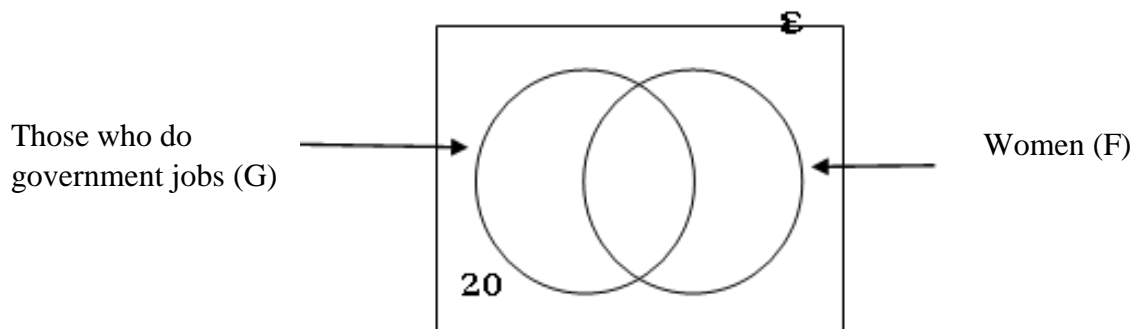
(b) Jeseema deposited Rs. 40 000 for an annual compound interest rate of 10%. Calculate the total amount she receives after two years.

3. The figure shows a part of a decoration. It is made of DBC right angle triangular portion and a sector with the angle at the centre 90° and the radius 7cm. (take $\pi = \frac{22}{7}$ for the following calculations)



- i. Find the area of the sector ABD.
- ii. If the area of the portion BCD is equal to the area of ABD sector, find BC length.
- iii. Find AD arc length.
- iv. If DC length to the nearest centimeter is 13, find the perimeter of the decoration to the nearest centimeter.
- v. Instead of the ABD portion, a rectangular shaped portion with the same area of ABD is needed to attach to the same side, taking DB as one side of the rectangle. Draw a sketch of it with relevant measurements in the same figure.

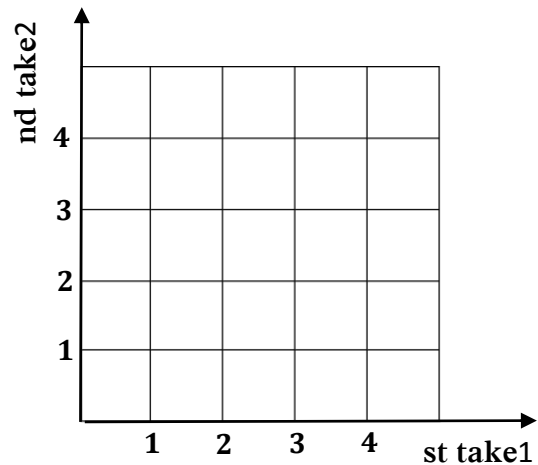
4. (a) Out of 100 people in a certain village, 53 do government jobs.
- i. How many of them don't do government jobs?
 - ii. If 49 of the whole group are women, complete the following Venn diagram using the given information.



- iii. How many men among the total group do government jobs?

(b) In a box, there are 4 identical cards marked 1 to 4 on each. A card is taken out of the box, marks its number and after putting that card into the box, another card is taken out and marks the number.

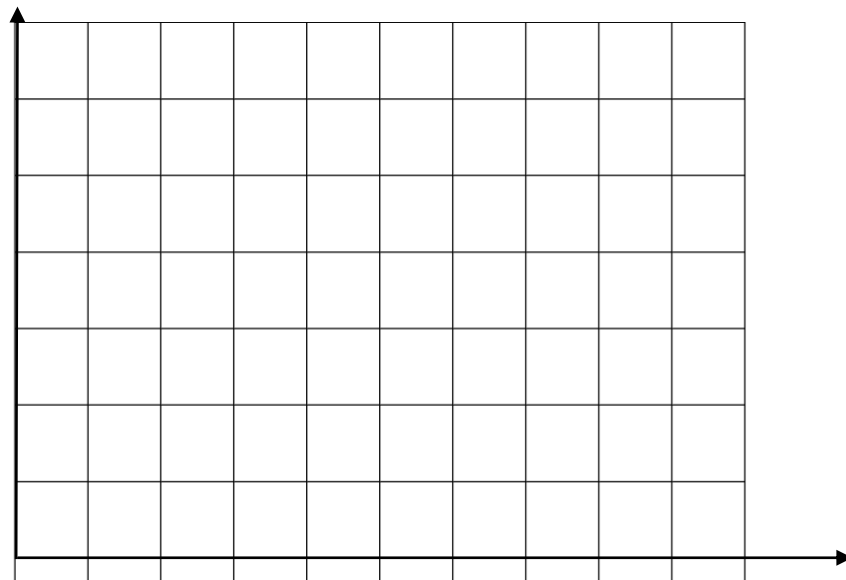
- i. Represent the sample space on the grid.
- ii. Find the probability of getting two cards in such a way that the sum of the numbers obtained in both occasions be 5.



5. Following table of values represent the marks obtained by a group of students for a mathematics paper. (20 – 30 means greater than or equal to 20 and less than 30)

Marks	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 100
No of students	3	4	10	7	6	6

- i. What is the height of the column which should be used to represent the number of students in the class interval 70 – 100 in a histogram?
- ii. Represent the above information in a histogram on the given grid.



- iii. Draw the frequency polygon for the histogram.
- iv. Express the number of students who scored more than 60 marks as a fraction of total number of students.

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 முதலாம் தவணை பரீட்சை - 2018
 Second Term Evaluation

ශ්‍රේණිය -
 தரம் 11
 Grade

විෂයය
 பாடம்
 Subject

Mathematics

පත්‍රය
 வினாத்தாள்
 Paper

II

කාලය
 காலம் 3 hours
 Time

Important:

- Answer 10 questions selecting 5 questions from part A and 5 questions from part B.
- Each question carries 10 marks.
- The volume of a right circular cone with the radius of the base r and the height h is $\frac{1}{3}\pi r^2 h$.
- The volume of a cylinder with the radius r and the height h is $\pi r^2 h$.

Part A

Answer 5 questions only.

1. A mobile phone worth Rs. 30 000 can be purchased by making a down payment of Rs. 12 000 and paying the remainder by 15 equal monthly installments with an annual interest rate of 36%. If the interest is calculated on the reducing balance, calculate the value of a monthly installment.
2. An incomplete table of values prepared to draw the graph of the function $y = 1 + 2x - x^2$ is given below.

x	-2	0	1	2	3	4
y	-7	-2	1	-2	-7

(a)

- i. Find the value of y , when $x=1$.
- ii. Draw the graph of the above function using a suitable scale.

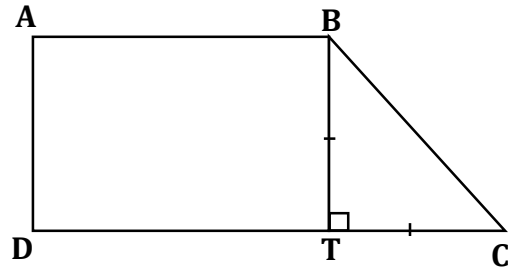
(b) Using the graph,

- i. Write the equation of the axis of symmetry.
- ii. Write the equation of the graph in the form $y = -(x - a)^2 + b$.
- iii. Find the positive root of the equation $x^2 - 2x - 1 = 0$

3. (a) Simplify. $\frac{x+1}{y} \div \frac{2(x+1)}{x}$

(b) A certain group of children bought some apples. When all apples are cut into 4 equal pieces and divided one piece for each child, 3 pieces remained. When all the apples are cut into 3 equal pieces and divided one piece for each child, there was a short of 2 pieces. By taking the number of children as x and the number of apples as y , build up a pair of simultaneous equations and find the number of children and the number of apples.

4. Figure shows ABCD trapezium shaped metal sheet.



- i. By taking the AD length as x meters, express the TC length in terms of x .
- ii. If the DC length is 2 meters more than the twice of the AD length, express the DT length in terms of x .
- iii. BTC right angle triangular portion is removed from the ABCD metal sheet. Write an expression for the area of the remaining portion, in terms of x .
- iv. If the area of the remaining portion is $5m^2$, show that $x = -1 \pm \sqrt{6}$.
- v. When $\sqrt{6} = 2.4$, show that the area of the whole metal sheet does not exceed $6m^2$.

5. A vertical telephone post is situated in an inaccessible location. The angle of elevation of the highest point of the post from the point X in the horizontal ground is 50° and the angle of elevation of the highest point of the post from a point 40m away to the post than X is 35° .

- i. Draw a sketch diagram with relevant measurements using the above information.
- ii. Using the scale 1: 1000 (1cm \rightarrow 10m), draw a scale diagram.
- iii. Using the scale diagram, find
 - (a) The height of the post.
 - (b) The distance from X to the foot of the post.

6. The information collected about 60 employers who came late during a certain day in a company is given below.

No of minutes they got late	0 - 4	4 - 8	8 - 12	12- 16	16 -20	20- 24	24- 28	28- 32
No of employers	5	6	8	10	12	8	7	4

(0 – 4 means greater than or equal to 0 and less than 4)

- i. What is the maximum time that an employer may have got late?
- ii. Using a suitable assumed mean or using another method, find the mean time in minutes that an employer gets late.
- iii. If there are 20 working days in a month and there are 186 employers working in the company, how many hours did the company lose during the month?
- iv. If the company pays Rs. 240 per hour for an employer, show that the amount lose by those employers does not exceed Rs. 240 000.

Part B

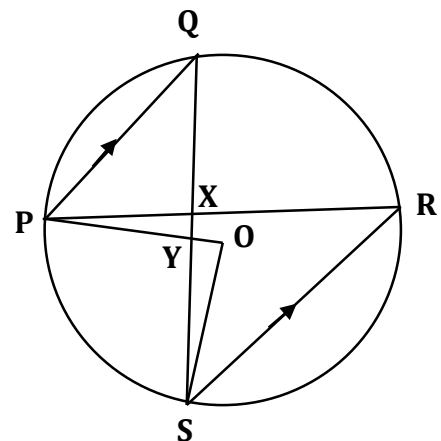
Answer 05 questions only.

7. In a certain part of a pandol light bulbs are connected to circular frames in equal distance. The bulbs are connected in such a way that in the first frame there are 16, in the second frame there are 20, in the third frame there are 24 and so on.
- When the number of light bulbs in the frames are taken as terms of an arithmetic progression, how many light bulbs are there in the 10th frame?
 - If there are 76 light bulbs in the last frame, how many circular frames are there in that part of the pandol?
 - If there 3 such parts in the pandol, Seneth says that the number of light bulbs needed for it is 2000. Do you agree with his statement? Give reasons.

8. Using only a straight edge and the pair of compasses do the following constructions.
- Construct the triangle ABC, where $AB = 5\text{cm}$, $AC = 6\text{cm}$ and $\hat{C}AB = 90^\circ$.
 - Construct the bisector of $\hat{C}AB$ and name the intersection point of the bisector and BC as D.
 - Construct a perpendicular to AB from D and name the intersection point of the perpendicular and AB as E.
 - Construct a circle with the center D and the radius AD.
 - Show that $AE = ED$, without measuring the length.

9. In the isosceles triangle ABC, $AB = AC$. The mid point of AB is D. The side AC is produced to F such that $DB = CF$. DE is parallel to BC. The lines BC and DF meets at G. Mark the given information on a sketch diagram and show that $GC = \frac{1}{4} BC$.

10. P, Q, R and S are points on the circle with the center O. the chords PQ and SR are parallel to each other. The lines QS and PR intersect at X and the lines QS and PO intersect at Y. show that,



- $\hat{P}OS = \hat{P}XS$
- The triangles PQX and XSR are equiangular.
- $\hat{P}OS = 2 \hat{Q}PX$
- Hence, name two isosceles triangles.

11. A solid metal cylinder with the radius a and the height $6a$ is melted and 20 solid metal cones with the radius of the base r and the height $2a$ are made without wasting any metal. Show that $r = \frac{3a}{\sqrt{20}}$.
When $a = 3.25$, using the logarithmic tables find the value of r .

12. (a) If $n(A \cup B) = 40$, $n(A) = 27$ and $n(B) = 28$, find $n(A \cap B)$.

(b) Both Vishwa and Ridma use public transportation to go to their work places. The probability of Vishwa getting late for work is $\frac{1}{5}$. The probability of Ridma getting late for work is $\frac{1}{3}$. Depict the relevant sample space in a tree diagram. Hence find the probability of,

- i. Both not getting late for work.
- ii. Only one getting late for work.
- iii. Who has the highest possibility of getting late for work. Give reasons.



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