OL/2020/32/E-I

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා **විභාග දෙපාර්තමේන්තුව** ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා
இலங்கைப் பரீட்சைத் திணைக்களமிலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம் இலங்
Department of Examinations, Sri Lanka De**இலங்கைப் பரீட்சைத் திணைக்க**ment of Examinat
ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංක **Department of Examinations, Sri Lanka** ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී
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32	E	I

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2020
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2020
General Certificate of Education (Ord. Level) Examination, 2020

ගණිතය	I
கணிதம்	I
Mathematics	**I**

පැය දෙකයි
இரண்டு மணித்தியாலம்
Two hours

Index Number: ....

Certified Correct

....

Signature of Invigilator

Important:

* This question paper consists of **8** pages.

* Write your **Index Number** correctly in the appropriate places on **this page** and on **page three**.

* Answer **all** questions **on this question paper itself**.

* Use the space provided under each question for working and writing the answer.

* Indicate the **relevant steps** and the **correct units** when answering the questions.

* Marks are awarded as follows:
  In Part A
   2 marks for each question
  In Part B
   10 marks for each question

* Blank papers can be obtained for scratch work.

For Marking Examiners' Use Only

Part	Question Numbers	Marks
A	1 – 25	
	1	
	2	
B	3	
	4	
	5	
	Total	

|	
....	....
First Examiner	Code Number
....	....
Second Examiner	Code Number
....	....
Arithmetic Checker	Code Number
....	....
Chief Examiner	Code Number

Part A
Answer all questions on this question paper itself.

1. The bill for the monthly phone usage of a household is 1500 rupees. 180 rupees is added to this as VAT. Accordingly, find the percentage that is charged as VAT.

2. Find the value of x according to the information given in the figure.
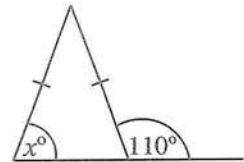
3. Solve: $\dfrac{1}{x} - \dfrac{1}{3x} = \dfrac{2}{3}$

4. It has been estimated that four men will take 6 days to complete a certain task. If two more men joined this group after they had worked for 3 days, in how many more days can this task be completed?

5. In the figure, ABC is a right angled triangle.
   Find the value of x according to the given information.
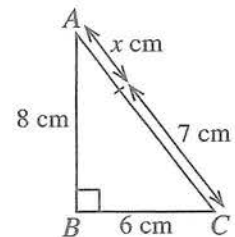
6. Find the least common multiple of the following expressions.
   $3x,\ 2xy,\ 4y^2$

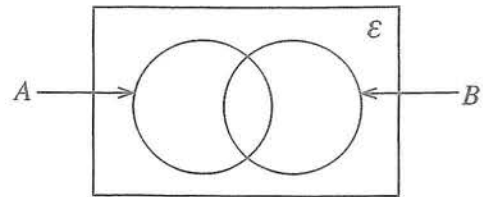7. Information relevant to the motion of an object travelling at a uniform speed is shown below.

Distance (metres)	0	4	8	12	16
Time (seconds)	0	2	4	6	8

   (i) Find the speed of the object in metres per second.
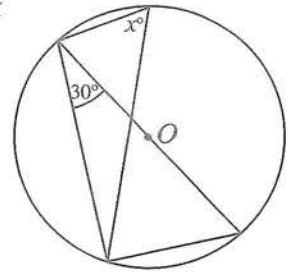
   (ii) Find the time the object takes to travel 22 metres at this speed.

8. Shade the region that represents $A' \cap B$ in the given Venn diagram.

9. The centre of the circle shown in the figure is O. Find the value of x according to the given information.

10. If $\log_a b = c$, underline the correct statement from the following statements.

   (i) $c^a = b$ (ii) $a^c = b$ (iii) $b^c = a$ (iv) $c^b = a$

11. Simplify: $\dfrac{3x}{y} \times \dfrac{5y^2}{6x}$

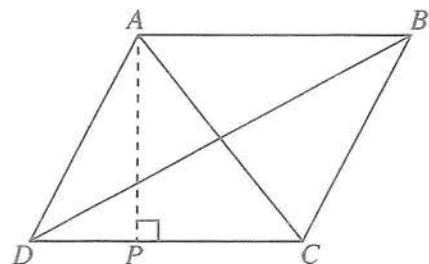12. A portion of a grouped frequency distribution is shown here.
    For the interval $11 - 15$, write
      (i) the upper class limit,

      (ii) lower class boundary.

| class interval	frequency
$5 - 10$	2
$11 - 15$	3
$16 - 20$	5

13. In the parallelogram $ABCD$, $AB = 12$ cm and the area of triangle BCD is 48 cm². Find the length of AP.

[see page four

14. AB is a vertical post located on a level ground and P and Q are two points on the level ground as shown in the figure. The top B of the post AB when observed from Q is seen with an angle of elevation of 70°. When observed from B, the point P is seen with an angle of depression of 50°. Represent this information in the figure.
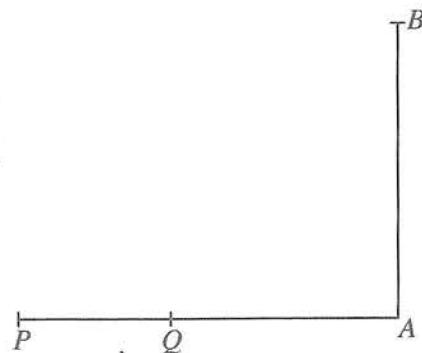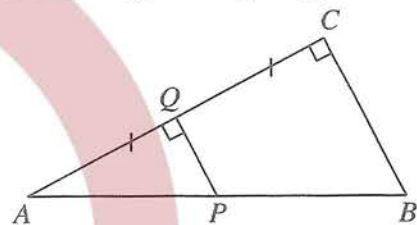
15. Find the third term of the geometric progression with first term 6 and second term –12.

16. Q is the midpoint of the side AC of the triangle ABC shown in the figure. $A\hat{Q}P = Q\hat{C}B = 90°$.

   (i) Name an angle equal to $A\hat{P}Q$.

   (ii) If $PQ = 4$ cm, find the lenth of BC.

17. A right prism with a right triangular cross section is shown in figure (A). Select and underline the figure which is **not** the shape of a face of the prism.
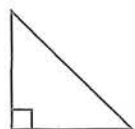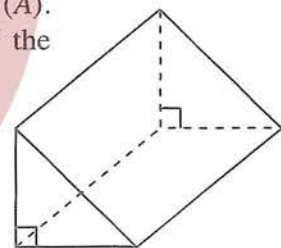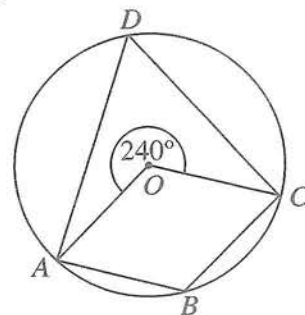
   (i)   (ii)   (iii)   Figure (A)

18. One factor of the expression $2x^2 + 3x + 1$ is $(x + 1)$. Find the other factor.

19. A circle with centre O is shown in the figure. Find the magnitudes of the following angles according to the given information.

   (i) $A\hat{B}C$

   (ii) $A\hat{D}C$

240°

20. Find the
 (i) gradient
 (ii) intercept

of the straight line which passes through the points $(0, 2)$ and $(5, 2)$.

21. The digits 2, 2, 3, 3, 4, 4 have been written on the six sides of a balanced die. Find the probability of a side with a prime number written on it falling face up when this die is rolled.

22. The points P, Q, R and S lie on the circle with centre O. The side SR has been produced to T and POM is a straight line. Find the value of y according to the information in the figure.
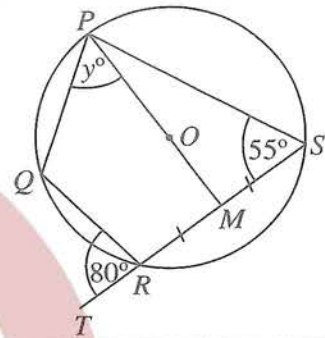

23. The arc lengths of the sectors of circles shown in figure (a) and figure (b) are equal. Find the value of R.

Figure (a) Figure (b)
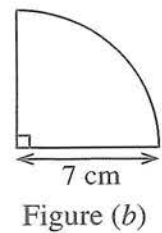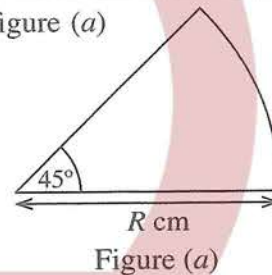
24. If $\begin{pmatrix} 1 & -1 \\ 0 & 2 \\ -1 & 1 \end{pmatrix} + \begin{pmatrix} 3 & 4 \\ 1 & -1 \\ 0 & y \end{pmatrix} = \begin{pmatrix} 4 & 3 \\ 1 & x \\ -1 & x \end{pmatrix}$,

find the value of x and then find the value of y.

25. The figure shows an incomplete sketch of a construction done to find the point P which is 5 cm from the straight line AB and equidistant from the points A and B. Complete the sketch indicating how the location of the point P is found.

5 cm

A B

50

* *

[see page six
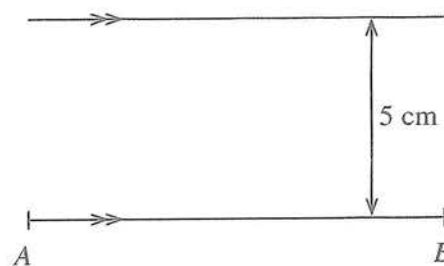
Part B
Answer all questions on this question paper itself.

1. A container of 5 litre capacity was completely filled with a soft drink. $\frac{3}{10}$ of this amount was used to serve drinks.

    (i) What fraction of the capacity of the container was the amount of soft drink remaining after using a portion to serve drinks?

    (ii) $\frac{5}{7}$ of the soft drink remaining in the container was poured into a bottle. What fraction of the capacity of the container was the amount of soft drink left in the container after that?

    (iii) Now, more soft drink was added to the amount of soft drink in the container until the amount in the container was exactly half the capacity of the container. Express the amount of soft drink poured into the container in litres.

$$\boxed{10}$$

2. The figure shows a flower bed consisting of a semicircular part of radius 14 m adjoining a rectangular part *ABCD*. Pebbles have been scattered in the two shaded rectangular parts outside the flower bed.

    (Take the value of π as $\frac{22}{7}$.)

    (i) Find the length *BC* of the rectangular part of the flower bed.

    (ii) Find the area of the semicircular part of the flower bed.

    (iii) If the area of the semicircular part is equal to the sum of the areas of the two parts in which pebbles have been scattered, find the length *AB* of the rectangular part.

    (iv) Find the perimeter of the whole flower bed and then find the length of a rectangle that has the same perimeter as the flower bed and breadth equal to the diameter of the semicircle.
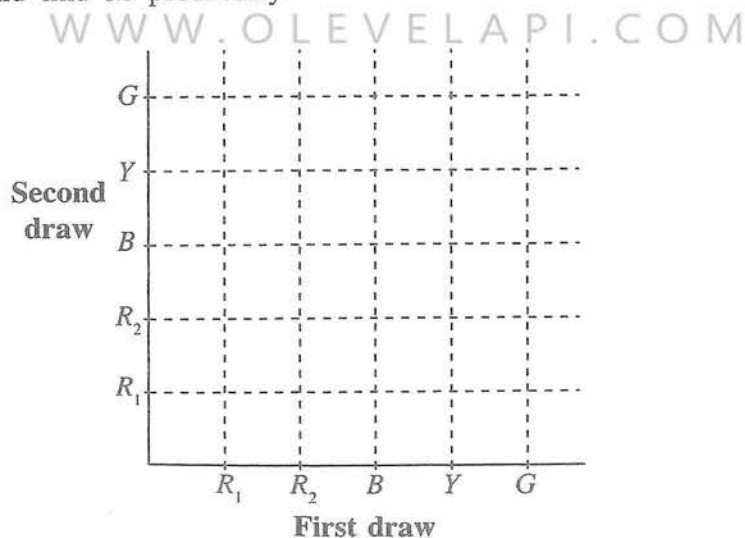
$$\boxed{10}$$
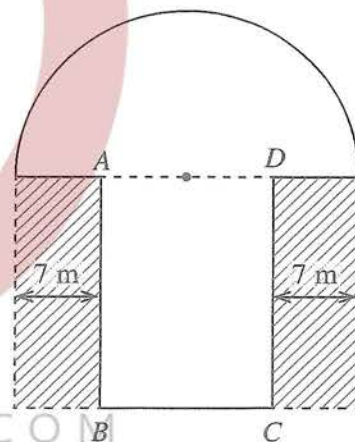
3.

> A certain urban council charges 12% of the annual
> assessed value as annual rates for houses.

(i) The annual assessed value of the house Kamal owns is 15 000 rupees. How much does he have to pay as annual rates?

(ii) Kamal rents his house out for a year for a monthly rent of 9000 rupees and receives the total rent as a single payment. Find the amount that remains after Kamal pays the annual rates and spends 8200 rupees on maintenance.

(iii) Kamal invests the remaining amount to buy shares of a company of which the price of a share is 40 rupees. If he receives dividends of 7350 rupees at the end of a year, how much does the company pay as annual dividends for a share?

10

4. (a) In a children's party, a game of drawing a ball randomly from a bag of balls and without replacing it, drawing another ball randomly, was played. In the bag were two red balls, (R_1, R_2), a blue ball (B), a yellow ball (Y) and a green ball (G) that were identical.

(i) Mark the sample space relevant to the above game in the given grid using the symbol 'X'.

(ii) To win the game, it was required to first draw either a blue ball or a yellow ball and then draw a red ball. In the grid, encircle the event of a child winning the game and find its probability.

Second draw / First draw grid with axes labelled G, Y, B, R_2, R_1 (Second draw) and R_1, R_2, B, Y, G (First draw)

(b) A factory uses two machines named A and B to produce a certain type of toy. $\frac{2}{5}$ of the total number of toys is produced by machine A while the rest is produced by machine B. The probability of a toy produced by machine A being defective is $\frac{1}{16}$ while the probability of a toy produced by machine B being defective is $\frac{1}{36}$.

(i) Using the above information, extend the incomplete tree diagram given below and include the relevant probabilities.

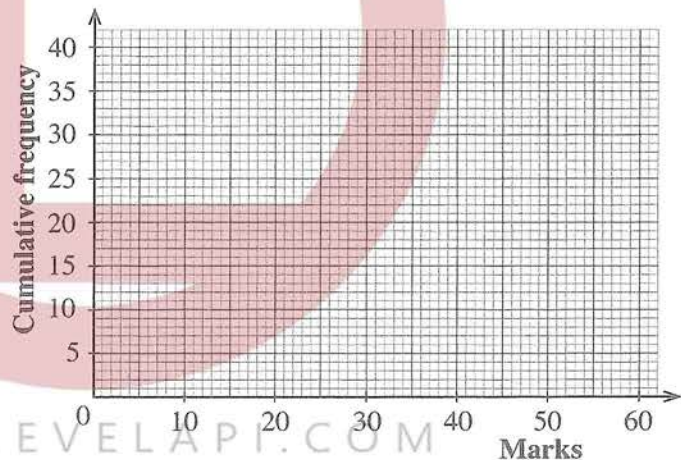$$\frac{2}{5} \quad \text{machine } A$$

$$\text{machine } B$$
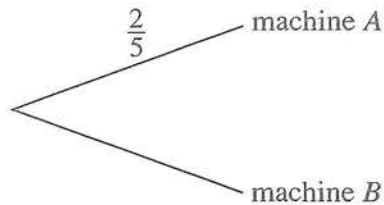
(ii) Find the probability of a toy produced by this factory being **without** defect.

10

5. An incomplete frequency distribution showing information on the marks obtained in a test by 40 students in a class, from a possible total of 60 marks is given below.

Class interval	Frequency	Cumulative frequency
0 – 10	3	3
10 – 20	5	8
20 – 30	…	14
30 – 40	8	22
40 – 50	12	…
50 – 60	6	40

(a) (i) Fill in the blanks in the table.

(ii) Draw the cumulative frequency curve on the given coordinate plane.

(b) Using this curve,

(i) if a prize is given to the students who obtained more than 45 marks, find how many students will be selected for it.

(ii) find the interquartile range.

10

* * *