PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE
THIRD TERM TEST - 2018
MATHEMATICS - I

Grade 10   **Two Hours**

Name / Index No. :

- **Answer all questions on this paper itself.**
- **Each questions carries two marks in Part A and 10 marks for each questions in Part B.**
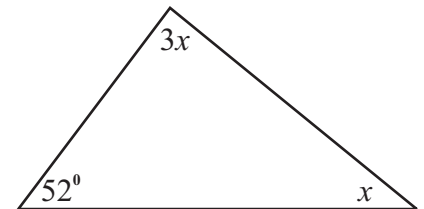
PART - A

01.   In between which whole numbers does the value of $\sqrt{40}$ lie?

02.   Solve, $\dfrac{12}{x} + 5 = 3$

03.   How long will it take to remove $540l$ of water amount in a tank, using a pipe through which water flows at a uniform rate of $18l$ per minute.
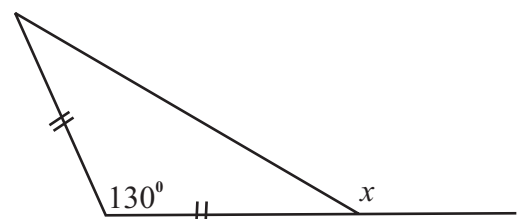
04.   Find the value of x.

05.   Factorize.

$2x^2 + x - 3$

06.   Write in index form.

$\log_3 27 = x$

07.   Find the value of x.

08.   A - {Multiples of 3 between 1 and 15}

   (i)   Write set A with elements.
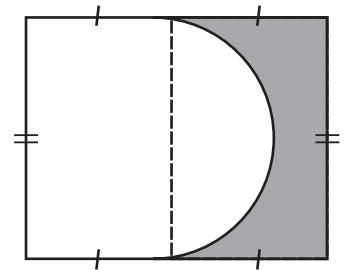
   (ii)   Find n(A).

09.   A house of assessed annual values Rs. 18000, is charged annual rates of 9%. Calculate the rates that have to be paid for a year.

10.   If the perimeter of the shaded part in the figure is 52cm. Find the perimeter of the unshaded part.
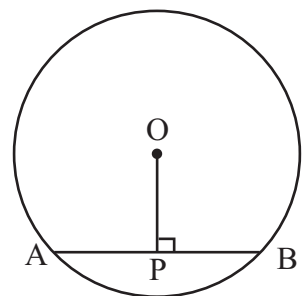

11.   Solve.

$$(x - 3)^2 = 16$$

12.   The mean age of 5 students is 13 years. When another student of 19 years age joined. Find the mean age of all the students.

13.   If the length of the chord AB is x cm, Write the length of AP in terms of x.

14. Find the time taken by a motor car, to travel the distance of 216km with the uniform speed of 72 kmh^{-1}.

15. The nth term of an arithmetic progression is 3n+2. In this progression, which term is 38.

16. Simplify.

$$\frac{3}{x} - \frac{1}{2x}$$

17. Using the information given in the diagram.

    (i)   Find the length of the side SR.

    (ii) Find the value of x.
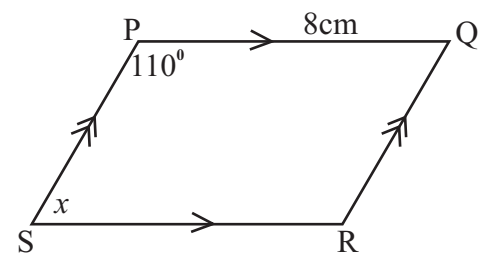
18. The probability of Vidusha passing the scholarship exam is $\dfrac{5}{7}$ and Dinusha passing the scholarship exam is $\dfrac{3}{4}$. Find the probability of both are passing the scholarship exam.

19. Write the equation of the straight line shown in the following cartesian plane.

20. According to the data given in the diagram, find the value of $A\hat{C}D$.
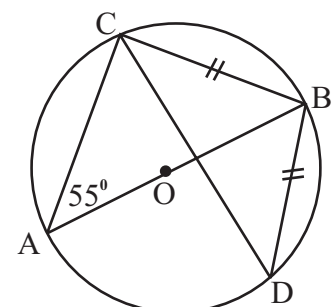
21. Find the positive integral solutions that satisfy the following inequality.

$$2x + 1 < 5$$

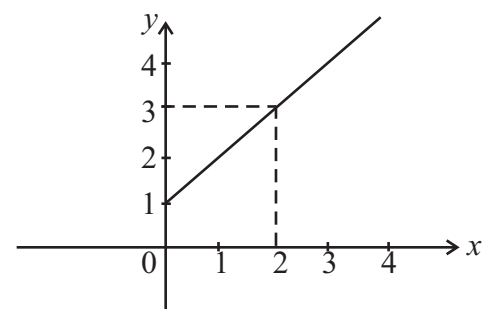22. In the diagram, CB = DE, $D\hat{A}C = A\hat{C}D$ and $B\hat{A}C = E\hat{F}D$. Name two congruent triangles in the figure and write their case of congruency.
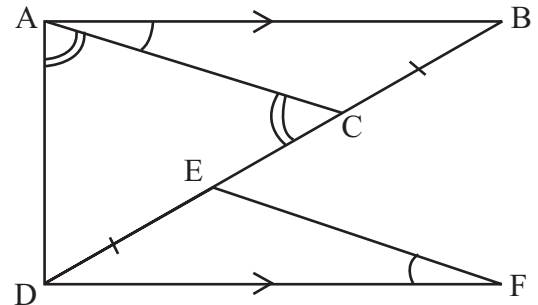
23. The external surface area of the following Cylinder (without the lid) is 954 cm². Find the curved surface area.

7cm
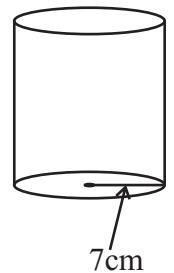
24. In the given figure, find the value of $P\hat{R}Q$.

R

O

60⁰

P   Q
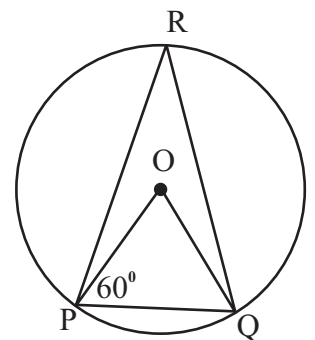
25. AB and AC are two boundaries of a land. The well P is situated such that 5cm from A and equidistance from AB and AC. By showing the constructing lines obtain the location of point P.

B

A

C
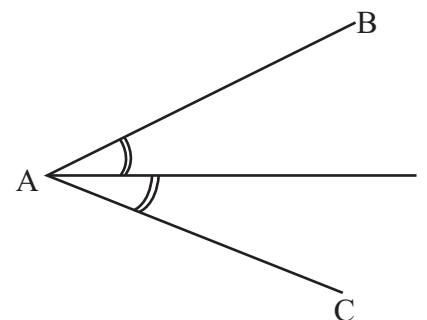
PART - B

(01) (a) Simplify.

$$2\frac{1}{2} \quad \left(\frac{3}{4} - \frac{1}{8}\right)$$

(b) Vipula received a question paper from his teacher. He answered $\frac{2}{5}$ of the questions of that paper in the first day and answered 3 questions in the 2nd day. At that time he was answered exactly half of the questions of the paper.

   (i) After answering the first day, write the remaining number of questions as a fraction of total number of questions.

   (ii) Write the number of questions answered in 2nd day as a fraction of total number of questions.

   (iii) If he had answered 24 questions, at the end of 3rd day, write the remaining number of questions he had to answer as a fraction of total number of questions.

(02) (a) Among two boys and three girls, it is needed to select the president for the Science association and English association in a certain school.

   (i) Represent the sample space related to selecting students for the post of president of both associations in the given grid.

   (ii) Find the probability of selecting, a boy student as the president of Science association and a girl student as the president of English association.

(iii)   Find the probability of selecting the same student for the both posts.

(b)   The tree diagram, related to selecting a student for the post of president of the Science association is given below.

   (i)   Complete the tree diagram and Extend it until selecting a student for the post of president of the English association.

Science association

$$\frac{2}{5}$$ — B

_ _ _. — G
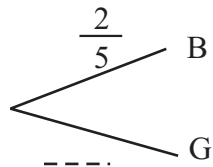
   (ii)   Find the probability of selecting a girl student as the president of, at least one of the associations.

(03)   The following pie chart represented that, the ways of proposed to spend an amount of money donated by an institute for a school.

To buy library books

To buy a computer

60^0

150^0

To repair the buildings

To repair the furnitures
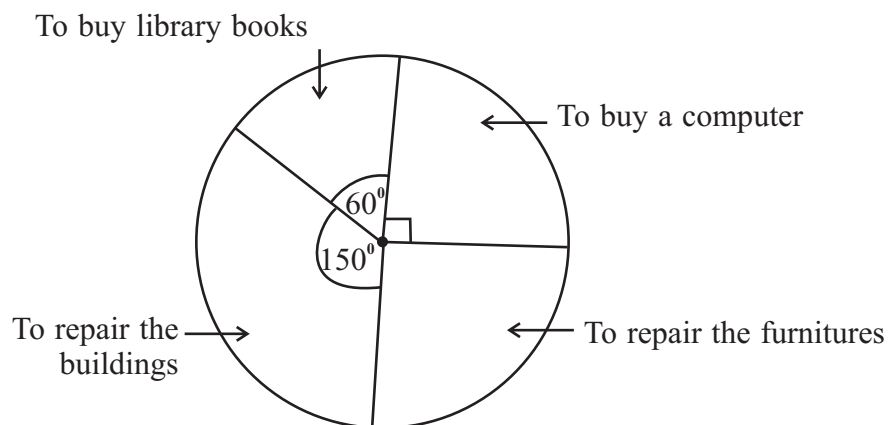
(i)   What is the magnitude of the angle at the sector, representing the proposed amount of money to repair the furnitures.

(ii)   If the price of the computer is Rs. 60 000, find the donated amount of money.

(iii) An addition donation of Rs. 10000 is donated by a parent to repair the furnitures, becuase the proposed amount is not enough for repair the furnitures. Considering the total donation including the new donated amount, find the angle of the sector that should be separated for repair the furnitures in the newly drawn pie chart.

(04)   In the figure, ABCDE is a memorial plaque, created by removing the parts P and Q from a thin rectangular plate.

(i)   Find the arc length of the removed semi circulator part of P.

(ii)   Find the area of P.

(iii) The part ABE of the memorial plaque is painted with silver. If the area of the shaded part Q is 42cm^2, Since find the area of the silver painted part.

(iv)   If the area of the plaque is 245cm^2, find the total height of the memorial plaque.
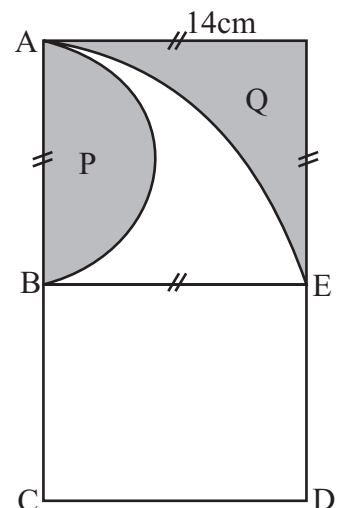
(05) (a) It takes 8 men 7 days to build a wall in a school. After 2 days starting the work, 2 men were absent. After working the remaining men in 2 days, the principal said that "due to an emergency function, it is needed to complete the work before 1 day of the sheduled date".

(i) What is the number of man days of the task of building the wall.

(ii) At the end of the 2nd day of starting the work, write the number of man days of the remaining task.

(iii) According to the requirement of the school, find the extra number of men needed to finish the task.

(b) If custom duty of 30% is charged when imported a certain type of clock worth Rs. 2800. Find the value of the clock after paying the custom duty.

PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE

THIRD TERM TEST - 2018

Grade 10   # MATHEMATICS - II   **Three Hours**

Name / Index No. :

- **Answer ten questions selecting five questions from part A and five questions from part B.**
- **Each questions carries 10 marks.**
- **The volume of a right circular cylinder with base radius r and height h is $\pi r^2 h$**

PART - A

(01) A statement from an advertisement of Perera's company is given below.

When buying a television by paying cash 8% discount and an electric kettle of Rs. 1200 is free

(i) When buying a television value of Rs. 50000, by paying cash find the amount to be paid.

(ii) Mr. Kusal takes a loan of Rs. 40 000 at an annual simple interest rate of 12% and deploying the balance buys a television of Rs. 50000 by paying cash.

    (a) Find the amount of money deployed by him except the loan amount.

    (b) How much does he have to pay in total to settle the loan at the end of 02 years.

(iii) Mr. Amarapala states that "If Mr. Kusal took the above loan for one year, he could get a profit". Is Mr. Amarapala's statement true. Give reasons for your answer.

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(02) An incomplete values of table prepared to draw the graph of the function $y = x^2 - 3$ is given below.

x	-3	-2	-1	0	1	2	3
y	6	1	-2	......	-2	1	6

(a) (i) Find the value of y, when $x = 0$.

    (ii) Using the scale of 10 small divisions as one unit along both x axis and y axis, draw the graph of the above function on a graph paper.

(b) Using the graph,

    (i) Write the equation of the axis of symmetry.

    (ii) Write the minimum value of the function.

    (iii) Write the range of the values of x, when $y < 0$.

    (iv) When the above function is moving one unit down along the y axis, write the equation of the graph received.

(03) (a) ABCD is a square. It's length of a side is 11cm. In the rectanle APQR, AP = (x + 2)cm and AR = 3cm. The area of the shaded part is greater than 97cm². Build up an algebraic inequality and find the maximum whole number that can be taken for x.
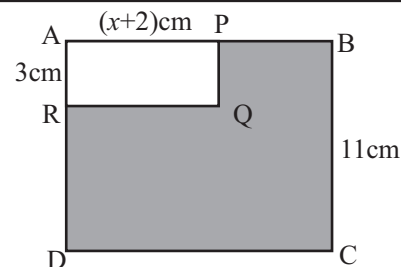
   (b) Solve, $x^2 - 5x - 6 = 0$

(04) In a farm with ducks and rabbits, a metal ring is fixed to every legs of every animals. The number of rings required for it is 100. In this farm, twice of the number of ducks is 25 greater than the number of rabbits. While spending Rs. 12 to create one duck ring, Rs. 1080 spent to create all 100 rings. By taking the number of ducks in the farm as x and the number of rabbits as y, Build up two equations and by solving them find the amount of money spent for a ring of a rabbit.

(05) (a) A solid metal cylinder and a solid metal triangular prism are shown in the figure.
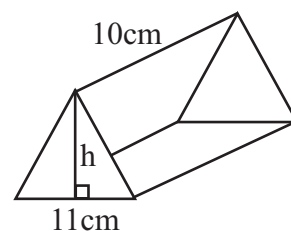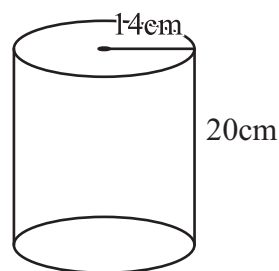
   (i)   Find the volume of the cylinder.

   (ii) Find the volume of the triangular prism in terms of h.

   (iii) If by melting the above solid metal cylinder, it is possible to made 32 triangular prisms in the above size, find the value of h.

   (b) Find the value using the logarithmic table.

        53.48   7.029

(06) The following table shows about the sales of pens in a canteen during a school term of 70 days.

Class interval (no. of pens)	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70
No. of days	7	10	21	16	9	4	3

   (i)   Write the modal class of the above frequency distribution.

   (ii) Find the number of days that sold more than 50 pens in a day.

   (iii) Taking the mid value of the class interval 31-40 as assumed mean, find the number of pens sold in a day to the nearest whole number.

   (iv) If in the first month of the next school term, there will be 19 school days, find the number of pens that can be sold in that month.

(07) (a) The following information was received, in the test of growth of a certain kind of flower plant.

Date	height of the flower plant
1st day	2cm
2nd day	5 cm
3rd day	8 cm

(i) When considering the height of the flower plant in the first three days, show that is follows an arithmatic progression.

(ii) Using formule, find the height of the flower plant in the seventh day.

(iii) After growing the flower plant to the height of 29cm, it will be flowering. Then find out the number of days spend for flowering.

(b) Using the formule, find the sum of the first 12 terms of the arithmatic progression 15, 13, 11, 9, ...

(08) Using only a straight edge with a cm/mm scale and a pair of compasses and showing the construction lines clearly.

(i) Construct the line segment PQ such that PQ = 6cm.

(ii) Construct the angle PQR, such that $P\hat{Q}R = 120^0$, and mark point R. Such that QR = 7cm.

(iii) Construct the locus of points equidistance form Q and R and mark the intersection point of the above locus and produced PQ as S.

(iv) Construct a line parallel to PQ through R and mark the intersection point of the parallel line and the above locus in part (iii) as T.

(v) Write a special name for the quadrilateral PQRT.

(09) In the parallelogram ABCD, the mid point of AD is E, and AB = AE.

Show that

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

(ii) BE ⊥ EC
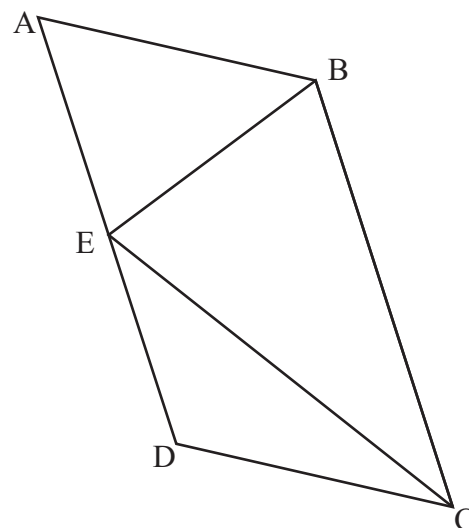
(10) Out of the 36 students in grade 10, the information about the students who playing a game is given below.

- No of girls in the class - 20.

- No of girls who playing the game - 8.

Boys (B) → 3 ← Students who playing games (S)
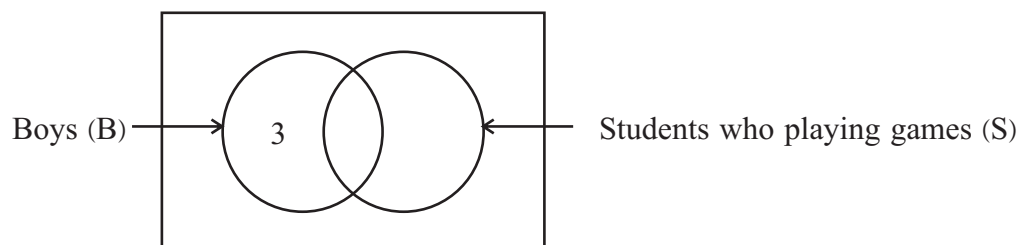
(i) Copying the incomplete venn diagram on to your answer sheet, complete it using the above data.

(ii) Shade the region that represents the girls who playing the game and write it in set notation.

(iii) How many times are there the number of girls who are not playing, as the number of boys who are not playing.

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(11) A rough sketch drawn by a group of students related to the location of three selected places in the school ground is given below. Taking the scale of 1 : 1000, Draw a scale diagram of the figure and find the actual distance between the places of C and D.

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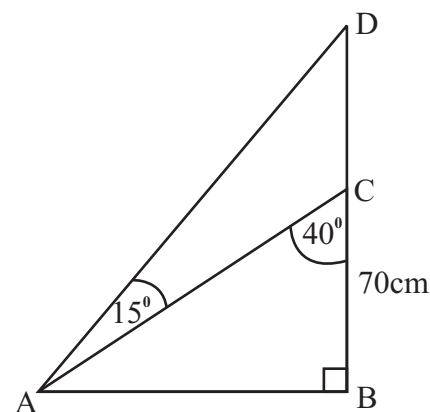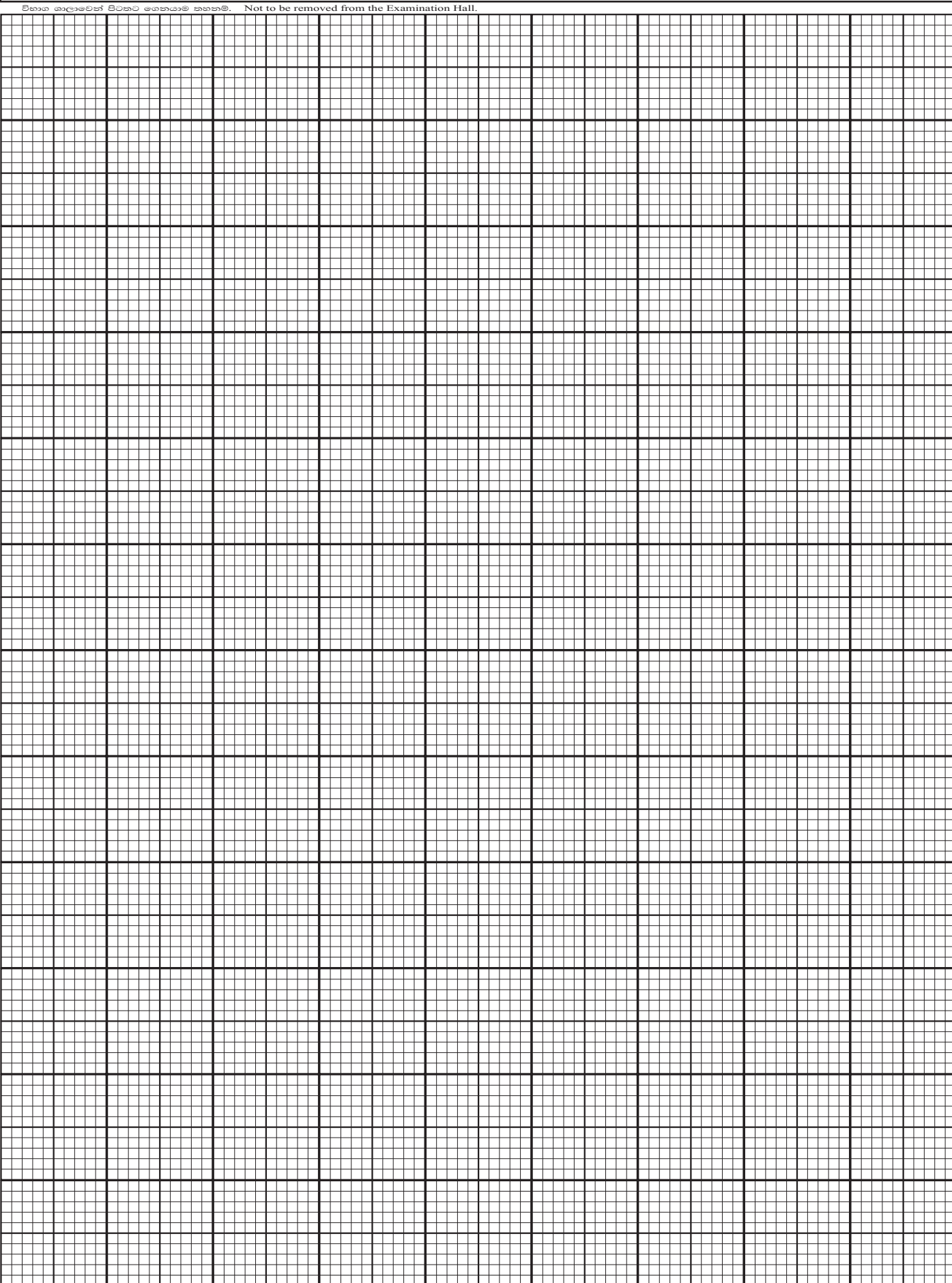
(12) By copying the given figure on to your answer sheet, write the answers for the following questions.

(i) If $A\hat{B}C = x$, Write the magnitude of $A\hat{O}C$ in terms x.

(ii) If $A\hat{O}C$ (reflex) = 210^0, find the value of x.

(iii) Produce the side BO and name the point it meets the circle as D. Find the value of $A\hat{D}C + A\hat{B}C$.

(iv) If $B\hat{C}O = 40^o$, find the magnitude of $O\hat{A}D$.

වයඹ පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Provincial Education - NWP
තෙවන වාර පරීක්ෂණය – **10 -11 ශ්‍රේණි – 2018**
Third Term Test - Grade 10 -11 - 2018

ගණිතය **II**

විෂයය Subject		විභාග අංකය Index No.	
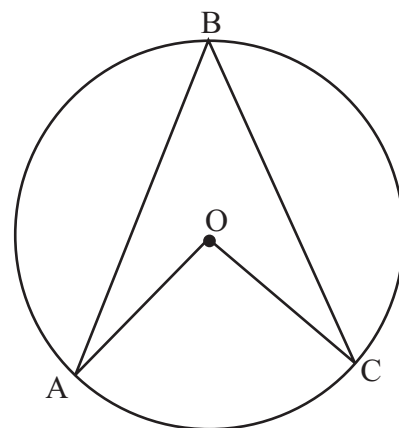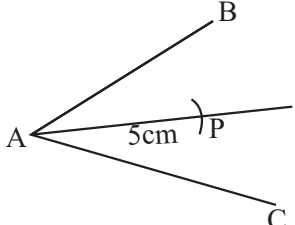
විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්.   Not to be removed from the Examination Hall.

ගණිතය **II**

Answer Sheet

Part I - A

01.	6, 7		02
02.	$x = -6$ $\dfrac{12}{x} = -2$	01	02
03.	30 minutes. $\dfrac{540}{18}$	01	02
04.	32º $4x = 128º$	01	02
05.	$2x^2 - 2x + 3x - 3$ $(2x + 3)(x - 1)$	01 01	02
06.	$3^x = 27$		02
07.	155^0 Obtaining 25^0	01	02
08.	(i) A = {3, 6, 9, 12} (ii) n(A) = 4	01 01	02
09.	$\dfrac{9}{100}$ x 18000 Rs 1620	01 01	02
10.	52cm		02
11.	$x = 7$ $x = -1$	01 01	02
12.	65 + 19 = 84 $\dfrac{84}{6}$ = 14 Years	01 01	02
13.	$\dfrac{x}{2}$ cm		02
14.	$\dfrac{216}{72}$ = 3 hours		02
15.	3n + 2 = 38 n = 12	01 01	02
16.	$\dfrac{5}{2x}$ Obtaining $\dfrac{6}{2x}$	01 01	02
17.	(i) 8cm (ii) 70^0	01 01	02

18.	$\dfrac{15}{28}$ $\dfrac{5}{7}$ x $\dfrac{3}{4}$	01	02
19.	$y = x + 1$ Identifying m = 1 or c = 1	01	02
20.	35^0 $A\hat{C}B = 90^0$ or $C\hat{D}B = D\hat{C}B = 55^0$	01	02
21.	1, 2 $x \leq 2$	01 01	02
22.	ACB and DEF (A A S)	01 01	02
23.	800cm² geting 154cm²	01 01	02
24.	30^0 $P\hat{O}Q = 60^0$	01 01	02
25.			02
			50

Part I - B

01.	(a) (i) $\dfrac{5}{2}$ $\dfrac{5}{8}$ $\dfrac{5}{2}$ x $\dfrac{8}{5}$ 4	02 01 01	04
	(b) (i) $\dfrac{3}{5}$		01
	(ii) $\dfrac{1}{2} - \dfrac{2}{5}$ $\dfrac{1}{10}$	01 01	02
	(iii) 10 x 3 = 30 30 - 24 = 6 $\dfrac{6}{30} = \dfrac{1}{5}$ or 24 $\dfrac{8}{10} = \dfrac{4}{5} - 2$ remaining $\dfrac{1}{5}$	01 01 01	03
			10

(01)

Answer Sheet

02. (a) (i)

02

(ii) $\dfrac{6}{25}$ 02

(iii) $\dfrac{5}{25}$ 01

(b) (i)

$\dfrac{2}{5}$ B $\begin{cases} \frac{2}{5} & B \\ \frac{3}{5} & G \end{cases}$ 01

$\dfrac{3}{5}$ G $\begin{cases} \frac{2}{5} & B \\ \frac{3}{5} & G \end{cases}$ 01   03

01

(ii) $1 - \dfrac{4}{25} = \dfrac{21}{25}$ or

$\dfrac{6}{25} + \dfrac{6}{25} + \dfrac{9}{25} = \dfrac{21}{25}$ 02

10

03. (i) $360^0 - 300^0 = 60^0$ 02

(ii) $60000 \times 4 = Rs. \ 240000$ 02

(iii) For Furnitures $\dfrac{60000}{90} \times 60$ 01

Rs. 40000   01

Rs. 50000   01

Total = Rs 250000   01

$\dfrac{5000}{250000} \times 360$ 01

72^0 01   06

10

04. (i) $\dfrac{1}{2} \times 2 \times \dfrac{22}{7} \times 7 = 22cm$ 02

(ii) $\dfrac{1}{2} \times \dfrac{22}{7} \times 7 \times 7 \ = 77cm^2$ 02

(iii) $196 - (42 + 77)$ 02

$77cm^2$ 01   03

(iv) $245 - 77 = 168cm^2$ 01

$\dfrac{168}{14} = 12cm$ 01

$12 + 14 = 26cm$ 01   03

10

05. (a) (i) $8 \times 7 = 56$ 01

(ii) $8 \times 2 = 16$ 01

$56 - 16 = 40$ 01   02

(iii) remaining man days $40 - 12 = 28$ 01

remaining no. of days 2   01

Total no. of men needed

$\dfrac{28}{2} = 14$ 01

Extra no. of men 8   01   04

(b) $\dfrac{130}{100} \times 28000$ 02

Rs. 36400   01   03

or

$\dfrac{30}{100} \times 28000 = 8400 \text{---------} 02$

$28000 + 8400 = Rs. \ 36400 \text{ ---} 01$

10

Paper - II   Part I - A

01. (i) $\dfrac{5000 \times 92}{100}$ 02

or discount 4000

Rs. 46 000   01   03

(ii) (a) Rs. 6000   01

(b) $\dfrac{12}{100} \times 40\,000 \times 2$ 01

Rs. 9600   01

Rs. 49 600   01   03

(iii) $4000 + 1200$

Rs. 5200   01

$5200 > 4800$ 01

statement is true   01   03

10

02. (a) (i) -3   01

(ii) Co -ordinates   01

Correct points   01

Smooth curve   01   03

(b) (i) $x = 0$ 01

(ii) -3   01

(iii) between - 1.7 and 1.7   02

(iv) $y = x^2 - 4$ 02

10

Answer Sheet

Paper II - Part A

03.	(a)	121	01	
		$3(x+2)$	01	
		$121 - 3(x+2) > 94$	01	
		$-3(x+2) > -24$	01	
		$x+2 < 8$	01	
		$x < 6$	01	
		Maximum value = 5	01	07
	(b)	$(x-6)(x+1) = 0$	02	
		$x = 6$ or $x = -1$	01	03
				10

04.	$2x + 4y = 100$	01	
	$2x - y = 25$	01	
	$x = 20$	02	
	$y = 15$	02	
	$20 \times 2 \times 12 = 480$	01	
	$1080 - 480 = 600$	01	
	$\dfrac{600}{60}$	01	
	Rs. 10	01	
			10

05.	(a)	(i)	$\dfrac{22}{7} \times 14^2 \times 20$	01	
			$= 12\ 320 cm^3$	01	02
		(ii)	$\dfrac{1}{2} \times 11 \times h \times 10$	01	
			$= 55 h cm^3$	01	02
		(iii)	$32 \times 55h = 12320$	01	
			$h = 7 cm$	01	02
	(b)		$1.7281 - 0.8469$	02	
			0.8812	01	
			7.607	01	04
					10

06.	(i)	21 - 30		01
	(ii)	7		01
	(iii)			

(iii)

x	d	fd	
5 - 5	-30	-210	01
15-5	-20	-200	
25-5	-10	-210	01
35-5	0	0	01
45-5	10	90	
55-5	20	80	01
65-5	30	90	
		-360	

	$35.5 + \dfrac{-360}{70}$	01	
	30.4	01	06
	30		
(iii)	30×19	01	
	570	01	02
			10

Paper II Part B

07.	(a)	(i)	$5 - 2 = 3$		01
			$8 - 5 = 3$		
			has a common difference		
		(ii)	$T_n = a + (n-1)d$	01	
			$T_7 = 2 + (7-1)3$	01	
			$T_7 = 2 + 6 \times 3$		
			$T_7 = 20$		
			20cm	01	03
		(iii)	$29 = 2 + (n-1)3$	01	
			$\dfrac{27}{3} = n - 1$	01	
			$9 + 1 = n$		
			$10 = n$		
			10 days	01	03
	(b)		$S_n = \dfrac{n}{2}\{2a + (n-1)d\}$	01	
			$S_{12} = \dfrac{12}{2}\{2 \times 15 + (12-1)-2\}$		
			$= 6\{30 \times 11 \times -2\}$	01	
			$= 6\{30 - 22\}$		
			$= 6 \times 8$		
			$= 48$	01	03
					10

08.	(i)	PQ Constructing		01
	(ii)	120^0 Constructing	01	
		Marking R	01	02
	(iii)	Constructing the locus	02	
		Marking S	01	03
	(iv)	eonstructing the parallel line	02	
		Marking T	01	03
	(v)	Trapezium		01
				10

Answer Sheet

Paper II - Part B

09.

(i) $E\hat{B}A = A\hat{E}B$ (AB = AE)   01
     $A\hat{E}B = E\hat{D}C$ (Alternate ∢)   01   02
      $E\hat{B}A = E\hat{B}C$

(ii) $A\hat{B}C = 2E\hat{B}C$ 01
     similarly,
      $B\hat{C}D = 2B\hat{C}E$ 01
    $A\hat{B}C + B\hat{C}D = 180^0$ (allied)   01
    $2E\hat{B}C + 2B\hat{C}E = 180^0$ 01
    $E\hat{B}C + B\hat{C}E = 90^0$ 01
    $B\hat{E}D + E\hat{B}C + B\hat{C}E = 180^0$ 01
    $B\hat{E}C + 90^0 = 180^0$ 01
      $B\hat{E}C = 90^0$ 01   08
   BE ⊥ EC

                     10

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10. (i)

     01
     01
     01
     01   04

   Showing 16, 13, 8, 12

(ii)

     01

     02   03

   M^1 S

(iii) 12, 3 Identifying   1
   $\dfrac{12}{3}$ 1
   4 times   1   03

                     10

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11. obtaining 1 cm ⟶ 10 m   01
   BC = 7cm drawing   01
   Showing the angles C and B   02
   Correctly   01
   Showing the point A   01
   Obtaining 15^0 01
   Place the point D   01
   CD = 5.8cm (±0.1)   02
   CD = 58m (±1)   **10**

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12. (i) $2x$ 01

(ii) $A\hat{O}C = 360^0 - 210^0$ 01
     $x = \dfrac{150^0}{2}$
      $= 75^0$ 01   02

(iii) Marking D   01
    $A\hat{O}C$ (creflex) $= 210^0$
    $A\hat{D}C = 105^0$ 01
    $A\hat{D}C + A\hat{B}C = 180^0$ 01   03

(iv) $C\hat{B}O = 40^0$ finding   01
    $A\hat{B}O = 35^0$ finding   01
    $B\hat{A}D = 90^0$ 01
    $D\hat{A}O = 55^0$ 01   04

                     10