PROVINCIAL DEPARTMENT OF EDUCATION - NORTH WESTERN PROVINCE

Second Term Test 2018

Grade 10 **MATHEMATICS - I** **Time : 2 hours**

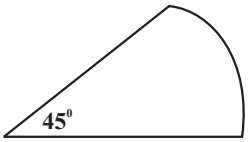
Name / Index No.

- **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

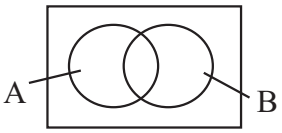
01. Find the value of $\sqrt{18}$ to the first approximation.

02. The area of the sector given in the following figure is $77cm^2$. Find the area of the circular lamina which it was cutting down.



03. Simplify, $\frac{2}{5a} + \frac{1}{3a}$

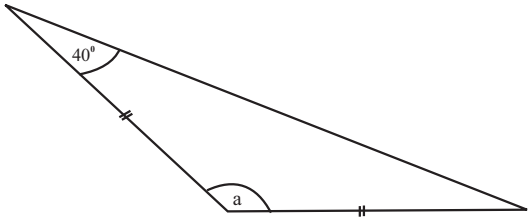
04. = { Farmers in a village }
A = { farmers who grow paddy }
B = { farmers who grow vegetables }



(i) Shade the region A B.

(ii) Write the shaded region as a description.

05. Using the data given, find the value of '***a***'.



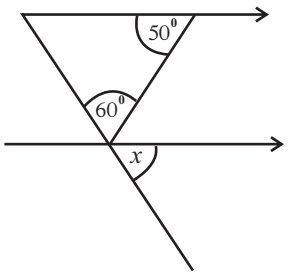
06. Write in logarithmic from,

$3^5 = 243$

07. From a tube, water flows at a rate of $2l$ per second. Find the amount of water flows from this tube within 5 minutes.

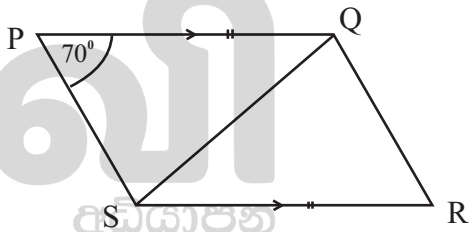
08. Solve, $\frac{x+5}{3} = 2$

09. Find the value of x,



10. Factorize. $x^2 - 7x + 10$

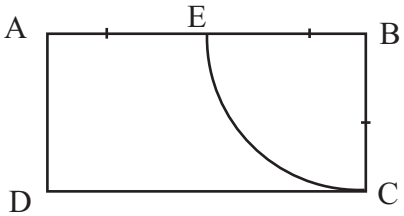
11. According to the data given in the diagram.



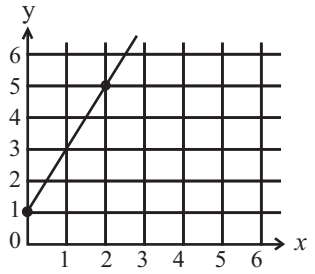
(i) Find the value of $\hat{QRS}$.

(ii) If the area of the triangle QRS is 28 cm^2, Find the area of PQRS.

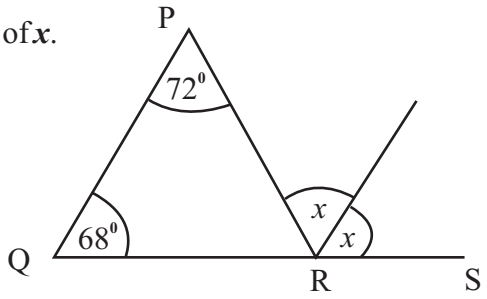
12. The perimeter of, the rectangle ABCD is 42cm and the sector BEC is 25cm. Find the arc length of EC.



13. Write the equation of the following straight line.



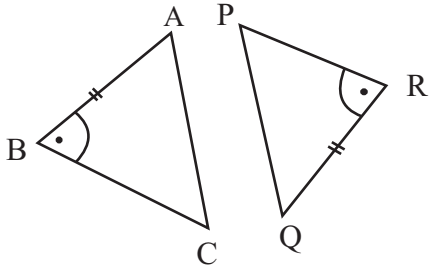
14. In the triangle PQR, the side QR is produced to S. Find the value of x.



15. Find the L.C.M. of following algebraic terms.

$6a^2b$, $8a^2b^2$

16. Of the given figure, name a pair of sides that should be equal for the congruency of the two triangles and write the case of congruency.



17. The information about the number of students who study Technological subject in a class is given in the following table. Find the probability of the randomly selected student is being a student of studying computer technology.

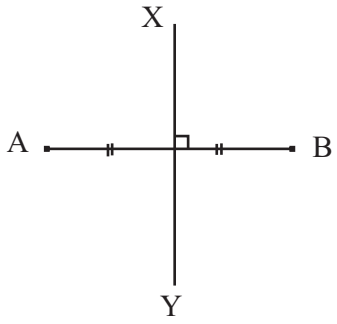
Subject	Agri science	Home economic science	computer technology
No. of student	12	15	8

18. Solve $(x+3)(x-1)=0$

19. Simplify. $\frac{1}{3}$ $\frac{3}{4}$ of $\frac{2}{3}$

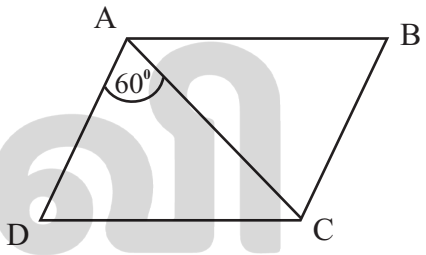
20. A 40% duty is imposed when a certain article is imported. The value of the article is Rs. 18500/- find the duty should be paid.

21. A and B are two points 10 m apart from each other. The point P is on the same side of x such that, with the equal distance from A and B and with the distance of 7cm from A. By showing the constructing lines obtain the point P.



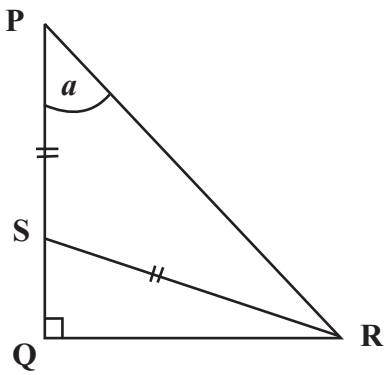
22. In a market the mean amount of rice sold in a day is 22kg. If the price of 1kg of rice is Rs. 100. Find the expected money that can be obtained by selling rice within a month.

23. In the parallelogram ABCD, $\hat{DAB} + \hat{BCD} = 220^0$.
Find the value of $\hat{CAB}$.



24. The base radius of a cylinder is 14cm and it' s surface area is 792 cm^2 . Find the height of the cylinder.

25. Write the value of $\hat{SRQ}$ in terms of ***a***.



PART - B

(01) In a three-wheel park $\frac{2}{5}$ of the registered three-wheelers are red in colour, $\frac{1}{2}$ are green in colour and remainders are blue in colour.

(i) Write the number of red and green colour three-wheelers as a fraction of the total number of three-wheelers in this park.

(ii) If the number of blue colour three-wheelers is 4, find the total number of registered three-wheelers in the park.

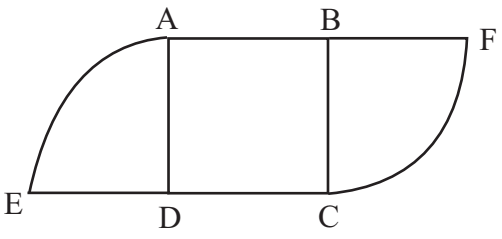
(iii) Find the number of registered red colour three-wheelers and green colour three-wheelers separately.

(iv) After registering several red colour three-wheelers newly in this park, the number of green and red colour three-wheelers are equal. Now write the blue colour three-wheelers in the park as a fraction of total number of three-wheelers.

(02) A flower bed constructed for the school mathematical park is given in the following figure. It is consists with a ABCD square part with the length of a side 7cm and two sectors.

(i) Find the radius of a sector.

(ii) Find the perimeter of the flower bed.



(iii) Find the area of the flower bed.

(iv) The teacher is instructed to seperate an isosceles triangular part in the square such that DC is a side of the isoscelese triangle and with the area of 14 m^2. Draw a sketch with measurements in the figure how isosceles triangular part should be separated.

03 (a) Mr. Piyasoma who borrowed Rs. 75 000 from a certain financial institution, settled the loan in 3 years by paying back Rs. 93 000.

(i) Find the total interest he paid.

(ii) Calculate the interest for one year.

(iii) Find the annual simple interest rate charged by the financial institution.

(b) The VAT amount paid by a person for a water bill under the 4% VAT percentage is Rs. 104.

(i) Find the initial value of the water bill.

(ii) Find the value of the water bill including VAT.

04. Information collected from 35 houses in a certain village about the consumption of units of electricity by each house during a month is shown in the table below.

No. of units of electricity	25	26	27	28	29	30	31
No. of houses	4	3	6	8	7	5	2

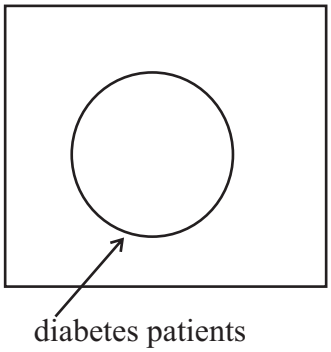
(i) Write down the mode of the above distribution.

(ii) Find the mean number of units of electricity consumed by a house of this village to the nearest whole number.

(iii) Find the number of units of electricity that can be expected to be used by a house of this village during a year.

(iv) Write the no of houses that used more than the mean no of units of electricity, as a percentage of the total number of houses in the village.

05. Of the 130 patients who came to the medical clinic 75 were diabetes patients. Among these patients there were 52 heart patients and all heart patients also suffer from diabetes.



(i) Find the number of diabetes patients who not suffering heart disease.

(ii) Insert the set representing the patients who suffering from heart disease and name it.

(iii) Complete the venn diagram using the above information.

(iv) When a patient is randomly selected, Find the probability of a selected patient is being a patient without both diabetes and heart disease.

PROVINCIAL DEPARTMENT OF EDUCATION - NORTH WESTERN PROVINCE

Second Term Test 2018

Grade 10 **MATHEMATICS - II** **Time : 3 hours**

Name / Index No.

- **Answer ten questions selecting five questions from part A and five questions from part B.**
- **Each questions carries 10 marks.**

PART - A

(01) The annual income of a businessman who imports and sells vehicles, is Rs. 1 350 000/=. The first Rs. 500 000 of the income is tax free. On the second Rs. 500 000 a tax of 4% is charged and on the third Rs. 500 000 a tax of 8% is charged.

(i) Find the total amount he should be paid as tax.

(ii) He pays Rs. 15 000 as rates for a quarter for his business building. The local body charges an annual rate of 6%. Find the annual assessed value of the building.

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(02) A table consisting of several values of x and their corresponding y values of the function $y = -x^2 + k$ is given below.

x	-3	-2	-1	0	1	2	3
y	-5	0	3	4	3	0	-5

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

(b) Using the graph you drawn,

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

(ii) Write the co-ordinates of the turning point.

(iii) Write down the range of the values of x for which the function is increased positively.

(iv) By finding the value of K, find the roots of the equation $-x^2 + k = 0$.

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(03) (a) In a guava tree of a certain school garden, the number of raw guava is 17 more than the number of ripe guava. By taking the number of raw guava in the tree as x.

(i) Write the number of ripe guava in terms of x.

(ii) If the total number of guava in the tree is 63, build up an equation including x.

(iii) By solving the equation, find the value of x.

(iv) Find the number of ripe guava in the tree.

(b) Solve the following quadratic equation,

$x^2 = x + 42$

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(04) In Vidyaloka Vidyalaya there are 35 students in grade 10A class. The number of boys in this class is 7 less than the twice of the number of girls. In the 1st term test, because each student had obtained more than 75 marks for the mathematics, a watch is received as a gift, for every boys with the price of Rs. 1000 and every girls with the price of Rs.700. Show that the amount of money spent for it is less than Rs.31000. (take the number of boys as x and the number of girls as y)

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(05) (a) A solid prism is given in the following figure. Its cross section is in the shape of isoscelese triangle and length is l.

(i) Find the area of the cross section of the prism.

(ii) If the volume of the prism is 960 cm^3. Find the value of l.

(b) Find the value using logarithmic tables.

$$\frac{7.3 \times 564}{24.76}$$

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(06) In a certain sports club, there are 120 members. The information about the selected games of them is given in the following table.

Game	No. of students
Running games	30
Field games	35
Team games	55

(i) Represent the above information in a pie chart.

There are only cricket, Volleyball and football as group games in this sports club. The number of members who selected Volleyball and Football is equal. The magnitude of the angle of the sector which represents the members who selected cricket is 45^0. Each and every members who selected team games were selected only one team game.

(ii) By representing the angle of the sector which represents the members who selected cricket on the above pie chart and find the number of members represented by it.

(iii) Find the number of members who selected foot ball.

(iv) Since, it is needed to 18 members for the cricket team, the remainng members are selected from the members who selected running events. Find the magnitude of the angle of the sector relevant to the remaining members for running games now.

PART - B

07 In a laboratory the chemical bottles are arranged in a rack is shown in the following.

no. of bottles in the 1st raw a

no. of bottles in the 2nd raw 6

no. of bottles in the 3rd raw 7

no. of bottles in the 4th raw 8

(i) By observing the arranged pattern, write the value of a.

(ii) According to the above pattern, if the number of bottles arranged in the n^{th} raw is T_n, show that $T_n = n + a - 1$.

(iii) Make 'n' as the subject of the above formula.

(iv) Hence, If the number of bottles in the last raw is 13. Find the number of raws which arranged bottles in the rack.

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 straight line segment AB = 7 cm. and construct it's perpendicular bisector.

(ii) Mark the point at which the above perpendicular bisector meets AB as D and obtain the point C on the above perpendicular bisector such that $D\hat{A}C = 60^0$

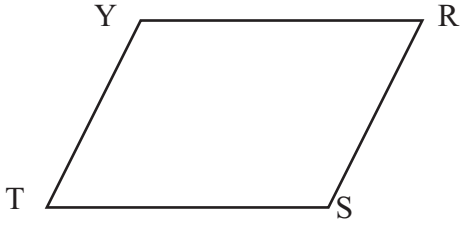
(iii) By giving reasons write a special name for the triangle ABC.

(iv) Construct the angular bisector of the $C\hat{D}B$ and name the intersection point of it and CB as E. Then find the value of $D\hat{E}C$.

09 TSRY is a parallelogram. The angular bisector of $Y\hat{T}S$ meets YR at A and the angular bisector of $S\hat{R}Y$ meets TS at B. Copy the diagram on to your answer sheet and insert the above data.

(i) Show that $Y\hat{T}A = S\hat{R}B$

(ii) Show that TBRA is a parallelogram.



(10) (a) Of the 30 students who came to the school co-operative shop 14 bought pens (P) and 18 bought books (B). The number of students who bought at least one of the above two items is 27. Insert the above data in a venn diagram and complete it.

(b) Out of a group of students who sitting around a round table with same gaps the 3rd student is faced to the 7th student. Both of them are girls and there are all boys in one section separated from both of them. Find the probability of that a siting student is being a boy.

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(11) (i) The uniform speed of two motor cycles is 60 km h^{-1} and 18 ms^{-1} respectively. Which motor cycle completed the distance of 60 km in minimum time. Explain your answer.

(ii) The capacity of a water tank which is on the roof of a certain clinic is 1500 *l*. When it filled completely, after opening the tap in the bottom of the tank, the water is distributed within 1½ minutes at the rate of 12 *l* per second. After that remaining water is distributed at the rate of 7 *l* per second. Find the time taken to empty the tank completely in minutes.

(iii) The circumference of a bicycle tyre is 250cm. The above tyre is fixed in to a machine for a speed test. The number of complete rounds rotated in the test is given in the following table.

Time	0	1	2	3	4
Number of rounds	0	2	4	6	8

a. Using the above information draw a distance - time graph.

b. Calculate the speed of the tire in ms^{-1}, within the speed test.

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(12) In the triangle ABC, AB = AC. The angular bisector of $B\hat{A}C$, meets the line drawn through C parallel to the AB at D. The above angular bisector meets CB at E.

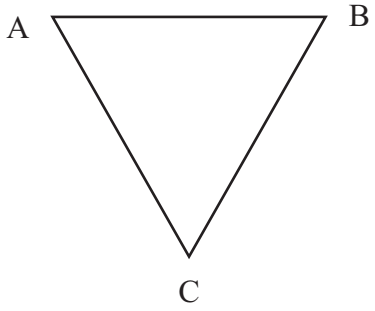
(i) By copying the incomplete diagram, Mark the above information on it.

Show that,

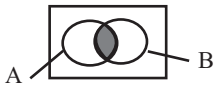
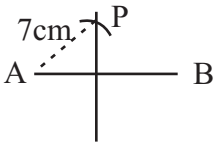
(ii) $A\hat{C}E = E\hat{C}D$

(iii) AEC ECD

(iv) AE $\perp$ CB.



Paper I - Part - A

(01)	4.2		②
(02)	77 x 8 616 cm^2	1 1	②
(03)	$\frac{6}{15a} + \frac{5}{15a}$ $\frac{11}{15a}$	1 1	②
(04)	(i)  (ii) farmer who grow both paddy & vegetables	1 1	②
(05)	$a = 100^0$ 180 - 80 or mark 40^0 on the diagram	1	②
(06)	$\log_3 243 = 5$		②
(07)	600 l 2 x 300	1	②
(08)	$x = 1$ $x + 5 = 6$	1	②
(09)	$x = 70^0$ 180 - 110	1	②
(10)	$(x - 5)(x - 2)$		②
(11)	(i) 70^0 (ii) 56 cm^2	1 1	②
(12)	obtain radius as 7 cm 25 - 14 = 11 cm	1 1	②
(13)	$y = 2x + 1$ $m = 2$ or $c = 1$	1	②
(14)	$x = 70^0$ $2x = 140^0$	1 1	②
(15)	24 $a^2 b^2$		②
(16)	BC & PR S. A. S.	1 1	②
(17)	$\frac{8}{35}$		②
(18)	$x = -3$, $x = +1$		②
(19)	$\frac{1}{3}$ $\frac{1}{2}$ $\frac{2}{3}$	1 1	②
(20)	$\frac{40}{100}$ x 18500 Rs. 7400	1 1	②
(21)	 mark point P showing AP = 7	1 1	②
(22)	22 x 30 x 100 Rs. 66 000	1 1	②
(23)	50^0 $D\hat{A}B = 110^0$	1 1	②
(24)	2 x $\frac{22}{7}$ x 14 x h = 792 h = 9 cm	1 1	②
(25)	90 - 2a $Q\hat{S}R = 2a$ or $P\hat{R}S = a$	1 1	②

Paper - I Part - B

(01)	(i) $\frac{2}{5} + \frac{1}{2}$ $\frac{9}{10}$	1 1	②
	(ii) obtain $\frac{1}{10}$ 40	1 1	②
	(iii) 40 x $\frac{2}{5}$ 16 40 x $\frac{1}{2}$ = 20	1 1 1	③
	(iv) new red colour three-wheelers 4 Total number of three-wheelers 44 $\frac{1}{11}$	1 1 1	③
			10

02. (i) 7 m ..... ①

(ii) $\frac{1}{2} \times 2 \times \frac{22}{7} \times 7 = 22$ 1

22 + 28 1

50 m ..... 1 ③

(iii) $\frac{1}{2} \times \frac{22}{7} \times 7 \times 7$ 1

77 + 49 1

126 m^2 ..... 1 ③

(iv) $\frac{1}{2}$ x 7 x h = 14

h = 4 m 1

drawing triangle 1

mark the perpendicular height 4 cm. ..... 1 ③

10

03. (a) (i) 93000 - 75000 1

Rs. 18 000 ..... 1 ②

(ii) Rs. 6000 ..... ②

$\frac{18000}{3}$ 1

(iii) $\frac{6000}{75000}$ x 100 1

8 % ..... 1 ②

(b) (i) $\frac{100}{4}$ x 104 1

Rs. 2600 ..... 1 ②

(ii) 2600 + 104 1

Rs. 2704 ..... 1 ②

10

(04) (i) 28 ..... 1 ①

(ii)

f	x
	100
	78
	162
	224
	203
	150
	62

..... 1

fx = 979 1

$\frac{979}{35}$ 1

27. 97 1

28 ..... 1 ⑤

(iii) 28 x 12 1

336 ..... 1 ②

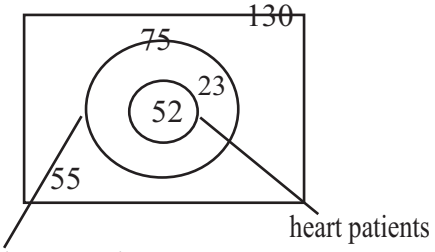
(iv) $\frac{14}{35}$ x 100 1

40 % ..... 1 ②

10

05. (i) 23 ..... ①

(ii)



showing as a subset 1

naming ..... 1 ②

(iii) illustrating 130, 75, 52, 23, 55 ..... ⑤

(iv) $\frac{55}{130}$ ..... ②

10

Paper II- Part A

01. (i) $\frac{4}{100}$ x 500 000 1

Rs. 20 000 1

Rs. 350 000 1

$\frac{8}{100}$ x 350 000 1

Rs. 28 000 1

20 000 28 000 1

Rs. 48 000 ..... 1 ⑦

(ii) 15 000 x 4

Rs. 60 000 1

$\frac{60\,000 \times 100}{6}$ 1

Rs. 1 000 000 ..... 1 ③

10

(02) (a) correct axis 1

marking points 1

curve ..... 1 ③

(b) (i) $x = 0$ ..... ①

(ii) (0, 4) ..... ②

(iii) $-2 < x \leqslant 0$ ..... ②

(02) (iv) $-x^2 + 4 = 0$

$x = 2$ or $x = -2$ ..... ②

10

(03) (a) (i) $x - 17$ 1

(ii) $x + x - 17 = 63$ 1

(iii) $2x = 80$ 1

$x = 40$ 1

(iv) $40 - 17$

$= 23$ ..... 1 ⑤

(b) $x^2 - x - 42 = 0$ ..... ①

$(x + 6)(x - 7) = 0$ ..... ②

$x = -6$ or $x = 7$ ..... ②

10

(04) $x + y = 35$ 1

$x - 2y = -7$ or $2y - x = 7$ 1

$3y = 42$ 1

$y = 14$ 1

$x = 21$ 2

$21 \times 1000 = Rs.\ 21000$ 1

$14 \times 700 = Rs.\ 9800$ 1

Rs. 30 800 1

$30\,800 < 31\,000$ 1

10

(05) (a) (i) $\frac{1}{2} \times 16 \times 6$ 1

$48\ cm^2$ ..... 1 ②

(ii) $48\,l = 960$ 1

$l = 20$ cm ..... 1 ②

(b) $\lg 7.3 + \lg 564 - \lg 24.76$ 1

$\lg 7.3 \times 10^0 + \lg 5.64 \times 10^2$

$- \lg 2.476 \times 10^1$ 1

$0.8633 + 2.7513 - 1.3938$ 1

$3.6146 - 1.3938$ 1

2.2208 anti lg 1

166.3 ..... 1 ⑥

10

(06) (i) running - 90^0 1

field - 105^0 1

team games - 165^0 1

drawing the pie chart ..... 2 ⑤

(ii) showing 45^o 1

$\frac{45}{3}$ 1

15 ..... 1 ③

(iii) 20 ..... ①

(iv) 81^0 ..... ①

10

(07) (i) 5 ..... ①

(ii) 1^{st} term $1 \times 1 + 4$

2^{nd} term $1 \times 2 + 4$

3^{rd} term $1 \times 3 + 4$ 2

n^{th} term $1 \times n + 4$

$Tn = n + 4$

$Tn = n + 5 - 1$ 1

$Tn = n + a - 1$ ..... 1 ④

(iii) $n = Tn - a + 1$ ②

(iv) $n = 13 - 5 + 1$ 1

$n = 8 + 1$ 1

$n = 9$ ..... 1 ③

10

(08) (i) constructing AB 1

perpendicular bisector ..... 1 ②

(ii) point D 1

constructing 60^o 1

point C ..... 1 ③

(iii) sides are equal or

angles are equal or 1

equilateral triangle ..... 1 ②

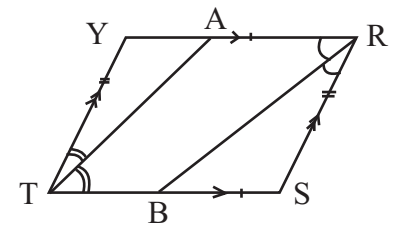
(iv) angular bisector 1

obtaining point E 1

135^o ..... 1 ③

10

(09)



correct diagram ②

(i) $\hat{YTB} = \hat{YRS}$ (Opp. ang.of the▱) 1

$\frac{1}{2}\ \hat{YTB} = \frac{1}{2}\ \hat{YRS}$ 1

$\frac{1}{2}\ \hat{YTB} = \hat{YTA}$ (data) 1

$\frac{1}{2}\ \hat{YRS} = \hat{SRB}$ (data) 1

$\therefore\ \hat{YTA} = \hat{SRB}$ ④

(ii) $\hat{YTA} = \hat{SRB}$ (proved)

$\therefore\ \hat{ATB} = \hat{ARB}$ 1

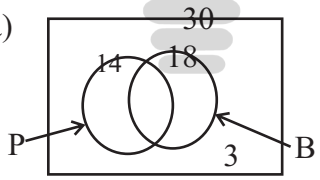
$\hat{YRB} = \hat{RBS}$(alternative angles) 1

$\therefore\ \hat{ATB} = \hat{RBS}$ 1

corresponding angles are equal
AT // BR
AR // TB (Opp. sid.of the▱) 1 ④

10

(10) (a)

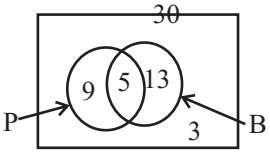


..... 3

n (P B) = 27 1

27 =14 + 18 - n (P B) 1

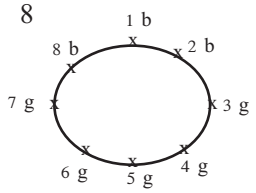
n (P B) = 5 1



mark 5 correctly 1

mark 9 & 13 ..... 1 ⑧

(b) $\frac{3}{8}$ ..... ②



..... 1

10

(11) (i) 18 ms^{-1} or 60 kmh^{-1}

$\frac{18 \times 3600}{1000}$ kmh^{-1} $\frac{60 \times 1000}{3600}$ 1

$16.7\ ms^{-1}$

64.8 kmh 1

60 kmh^{-1} < 64.8 kmh^{-1}

or 16.7 < 18

motor cycle with the speed 18 ms^{-1} 1 ③

(ii) 1080 l 1

remaining water volume = (1500 - 1080) l

= 420 l

the time released the remaing

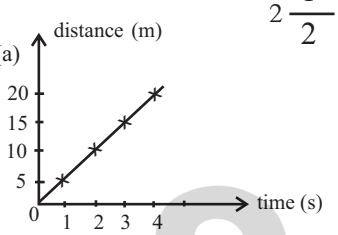
water amount = $\frac{420}{7}$ 1

= 60 S

total time = $(1\frac{1}{2} + 1)$

$2\frac{1}{2}$ min. 1 ③

(iii) (a)

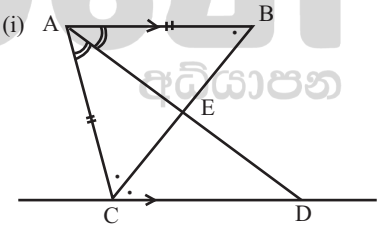


②

(b) speed = 5 ms^{-1} ②

10

(12) (i)



①

(ii) $\hat{ABC} = \hat{ACE}$ (AB = AC) 1

$\hat{ABC} = \hat{ECD}$ (alternative angles) 1 ②

$\hat{ACE} = \hat{ECD}$

(iii) $\hat{C}$ $\hat{}$ (angular bisector) 1

$\hat{EAB} = \hat{EDC}$ (alternative angles) 1

$\hat{CAE} = \hat{EDC}$ 1

$\hat{ACE} = \hat{ECD}$ (proved)

CE = CE (common side) 1

AEC$\Delta \equiv$ ECDΔ (A. A. S.) 1 ⑤

(iv) $\hat{AEC} = \hat{CED}$ corespon. ele. of the cong.Δ) 1

$\hat{AEC} = \hat{CED} = 90^{o}$ (suppl. adj. angles) 1

AE $\perp$ CD (A. A. S.) ②

or

give marks for showing 900 by using the features of isosceles Δ

10