PROVINCIAL DEPARTMENT OF EDUCATION NORTH WESTERN PROVINCE

THIRD TERM TEST - 2018

MATHEMATICS - I

Grade 11 **Two Hours**

Name / Index No. :

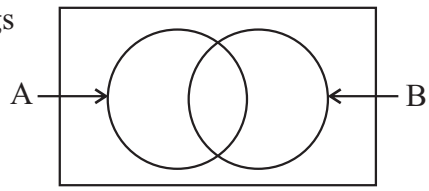
- **Answer all questions on this itself.**
- **Each questions carries two marks in Part A and 10 marks for each questions in Part B.**

PART - A

01. Underline the nearest value for $\sqrt{75}$ by using $\sqrt{75} = 5\sqrt{3}$

(1) **5 x 1.5** (2) **5 x 1.6** (3) **5 x 1.7** (4) **5 x 1.8**

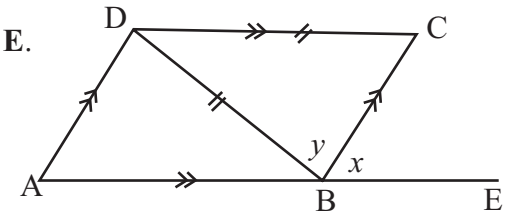
02. According to the Venn diagram given, shade the region which belongs to $(A \quad B)'$.



03. Write $3^{-2} = \frac{1}{9}$ in the logarithmic form,

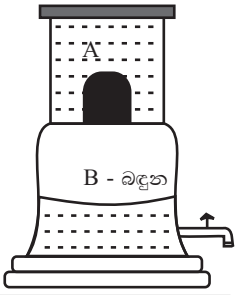
04. Solve, $2x^2 - 32 = 0$

05. The side **AB** of the parallelogram **ABCD** is produced to **E**. If **BD = DC** and $B\hat{A}D = 42^0$ find the values of x and y.

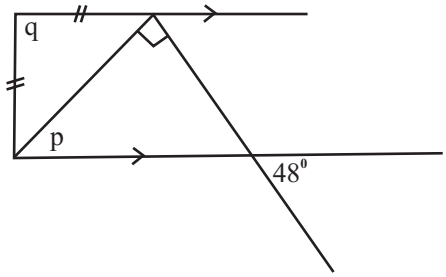


06. A seller bought **1500** mangoes at the price Rs. **25.00** per one and he sold them at the price of Rs. **30.00** per one. Find the percentage of profit gained.

07. The water in the vessel **A** of the water filter flow to the vessel **B** at the rate of **50** liters per minute. According to that find the amount of water flown to vessel **B** in one hour.



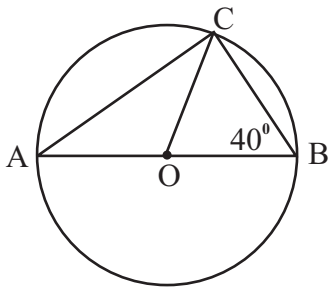
08. According to the information given in the figure, find the values of p and q.



09. Simplify, $\frac{7}{x+1} \times \frac{2(x+1)}{21}$

10. A work which is completed by **6** men in **3** days can be completed by a machine in one hour. How many men does it need to allocate to complete a work in 6 days which can be completed by the machine in 3 hours?

11. **AB** is a diameter of a circle with the centre **O**. According to the given information, find the magnitude of $\hat{ACO}$.



12. **A** and **B** are two mutually exclusive events. If $P(A) = \frac{1}{6}$ and $P(B) = \frac{1}{3}$ find $P(A \cup B)$.

13. The cone given in the figure **B** is prepared by using the sector given in the figure **A** with the radius l and the arc length **22cm**. Find the base radius of the cone.

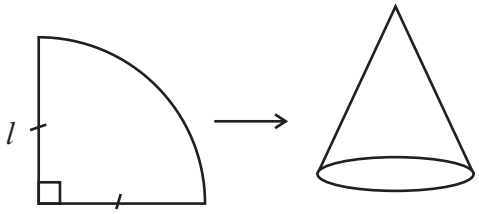
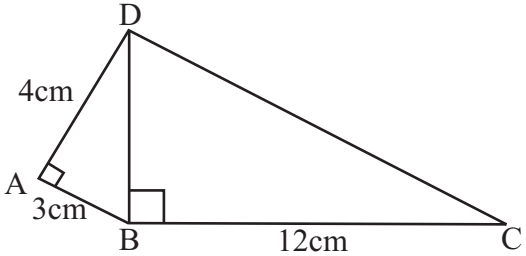
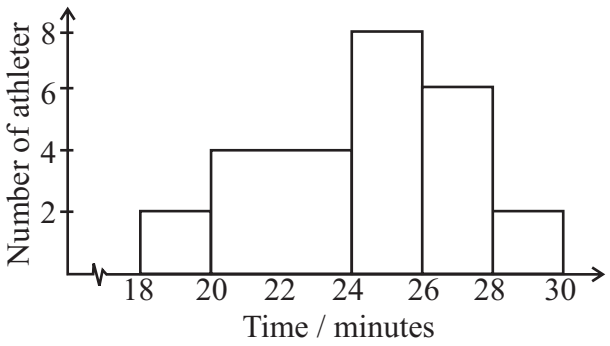


Figure A Figure B

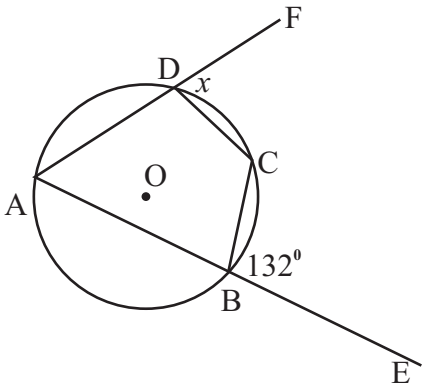
14. Find the perimeter of the quadrilateral **ABCD** according to the given information.



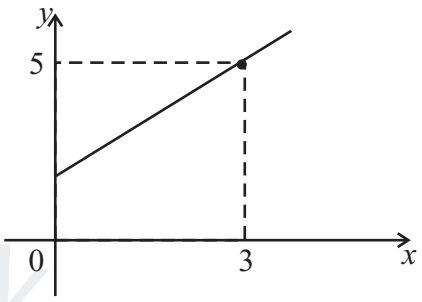
15. A histogram drawn according to the times spent by athletes to complete a marathon is given below. Find the number of athletes who complete the marathon.



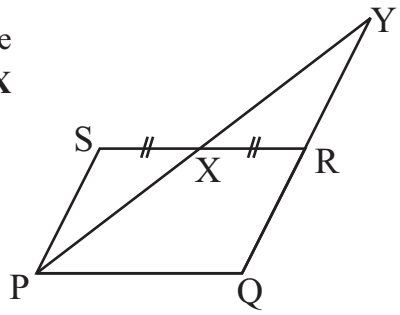
16. Of the cyclic quadrilateral **ABCD, AB** is produced to **E** and **AD** is produced to **F**. If $\hat{CBE} = 132^0$, Find the value of x^0.



17. Find the gradient of the line given with the intercept **2** and write its equation in the form of $y = mx + c$.



18. Of the parallelogram **PQRS**, the midpoint of **SR** is **X**. The produced line **PX** and **QR** meet a **Y**. Write the case of congruency of the triangles **PSX** and **XYR**.

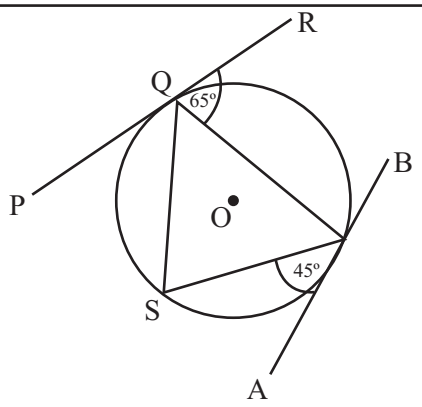


19. Factorize, $(x+1)^2 - 9$

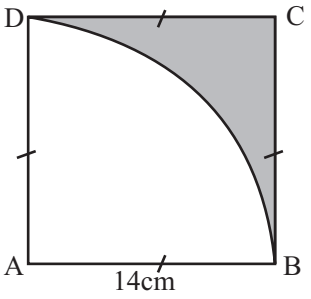
20. Find the greatest integer which satisfies the inequality

$4x + 2 < 3x + 5$

21. **PR** and **AB** are two tangents of a circle with the centre **O**, According to the information given in the figure, Find the value of $\hat{SQR}$.



22. The side length of the square given in the figure is **14cm**. Find the area of the shaded part.



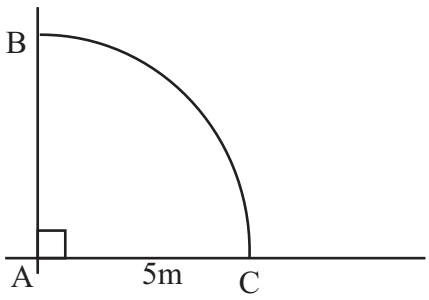
23. If following statements are true, put mark to the box.

(i) When the two metrices are added, the order of the matrices should be equal and when the two metrices are subtracted it is not needed. ☐

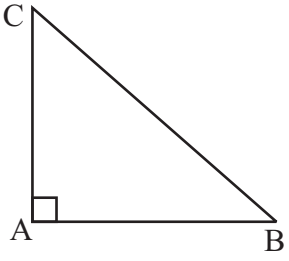
(ii) To multiply two metrices, the number of columns of the first metrix should be equal to the number of rows of the second metrix. ☐

(iii) **1 x n** is a column metrix. ☐

24. The locus of the point equidistance to **A** is given by the arc **BC**. Draw the location of the point **P** which locates on the arc **BC** and equidistance to **A** and **B** points by using knowledge on loci.



25. If **AB** = $\sqrt{19}$ **cm** and **AC** = **9cm**, find the **Sin** $\hat{ACB}$.



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(01) Following conditions are requested when a housing loan is given by certain institute.

- 70% of the value of the land allocated to construct the house can be obtained as a loan.
- $\frac{1}{3}$ Of the loan should be allocated for the making the floor.
- $\frac{3}{14}$ of the remaining amount of the loan should be allocated for the sanitary purposes.

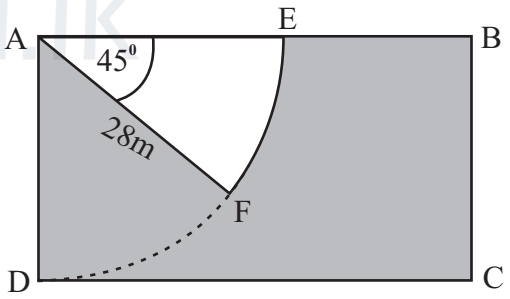
(i) After spending for the making the floor, what is the remaining portion of the total amount of the loan on the hand of Mr. Siridasa who obtained a loan by agreeing to the above conditions?

(ii) What is the portion of the total amount of the loan spent by Mr. Siridasa for the sanitary purposes?

(iii) If the amount spent for the making the floor is Rs. 20 000 more than the amount spent for the sanitary purposes, find the lone amount taken by Mr. Siridasa.

(iv) Find the value of the land of Mr. Siridasa.

(02) The sector AEF is a sketch of a ground plan of a modern building to be constructed in the rectangular block of land ABCD. AF = 28cm and EB is the entrance of the block of land. ($= \frac{22}{7}$)



(i) What is the fraction of the sector from a circle with the same radius?

(ii) Find the area of the portion AEF of the land allocated to construct the building.

(iii) If the area of the block of land ABCD is equal to three times of the area of the sector AEF, find the length of the entrance EB.

(iv) Find the length of the arc EF.

(v) The shaded portion is a compound which located outside of the building. Find the perimeter of the shaded portion of the land.

(03) (a) Rs. 500 000 of the annual income of Mr. Vijitha is tax free. 4% of income tax should be paid for remaining amount of his annual income. His monthly income is Rs. 55 000.

(i) Find the annual income of Mr. Vijitha.

(ii) Find the annual income tax to paid by Mr. Vijitha.

(b) Mr. Vijitha bought shares by investing Rs. 72 000 when price of a share of a certain mass media company is Rs. 12. Rs. 3.50 per each share is paid as the dividend for the shareholders of the company.

(i) Find the number of shares bought by Mr. Vijitha.

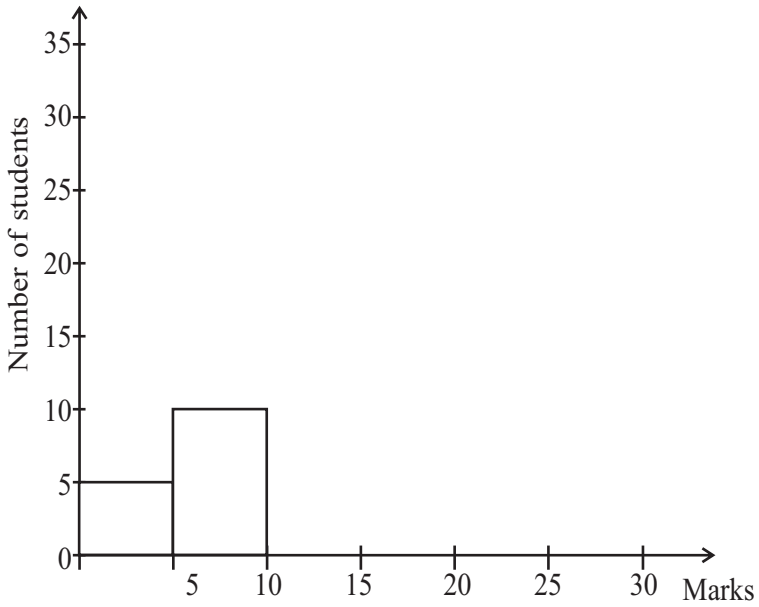
(ii) If all shares he owns, are sold when the market price of above company is Rs. 15. At the same day, company noticed that the dividends will be paid for shares.

(1) Find the capital gain obtained by Mr. Vijitha.

(2) If he did not sell shares, find the profit that he can obtain.

(04) (a) An incomplete table including the marks obtained by a set of students for an assignment having maximum mark of 25 who participated for a mathematical workshop and an incomplete histogram drawn to represent the student's marks are given below.

Marks	Number of students
0 - 5	.....
5 - 10	.....
10 - 15	20
15 - 25	20

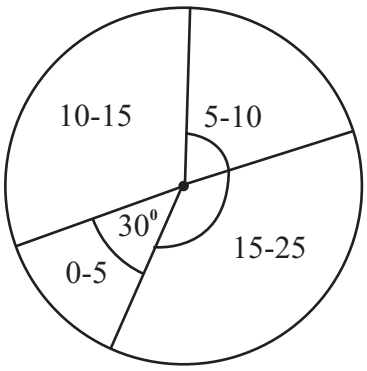


(i) Complete the table by using the histogram.

(ii) Complete the histogram according to the information given in the table.

(iii) Draw the frequency polygon according to the histogram.

(b) When above table is prepared, it is revealed that marks of certain students are not included after first hour. Their marks do not belong to the interval of 0 - 5. After that following pie-chart is drawn by including their marks also.



(i) According to the pie-chat, find the total number of students participated for the workshop.

(ii) Find the number of students who are not represented by above histogram.

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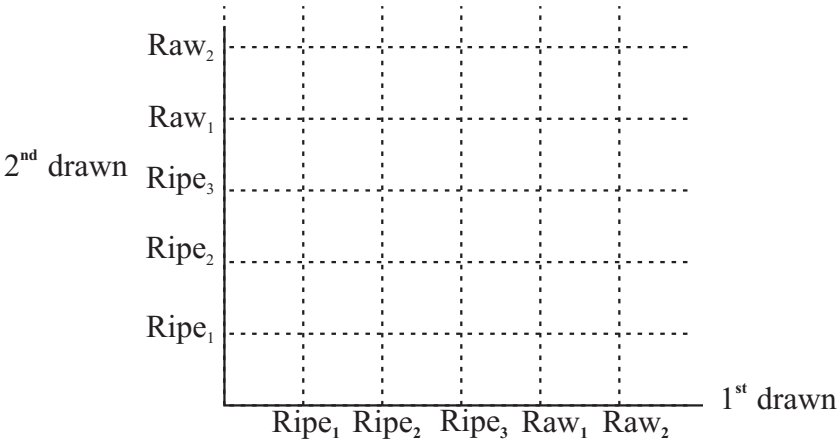
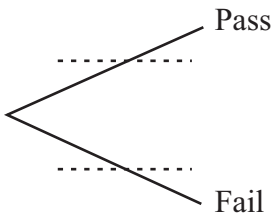
(05) (a) There are 5 wood apples in a box. All wood apples are identical. Two of them are raw. Priyantha takes a wood apple from the box randomly and if it's ripe, he gives it to his sister and take another one. If first one is raw, again he takes another one by replacing the first one.

(i) Represent the sample space including all possible outcomes on the following grid.



(ii) Indicate the event of both of drawn fruits being in ripe or raw. Find the probability of the event.

(b) (i) According to the previous reports of smoke emission testing institute, The owner of the institute said that the probability of fail the test by a three wheeler is $\frac{3}{8}$ and the probability of fail the test by a motor bicycle is $\frac{1}{7}$. Complete the tree diagram drawn to represent the fail or pass the test by a three wheeler came for the smoke emission test.



(ii) Extend the tree diagram to represent fail or pass the test by a motor bicycle which came next for the smoke emission test.

(iii) Find the probability of failing the test by only one vehicle.

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THIRD TERM TEST - 2018

MATHEMATICS - II

Grade 11 **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 radius of the cross section r and height h, is r^2h. The curved surface area of the cylinder is 2 rh. Take $= \frac{22}{7}$.**

PART - A

(01) An incomplete value table prepared to draw the graph of the function, $y = 7 - (x+1)^2$ is given below.

x	-4	-3	-2	-1	0	1	2
y	-2	3	6	.....	6	3	-2

(i) Find the value of y when $x = -1$.

(ii) Draw the graph of the function by taking suitable scale for both the x axis and y axis.

(iii) By using the graph,

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

(b) Write the coordinates of the turning point.

(iv) Write down the interval of x in which the function is positive and decreasing.

(v) When $y = 0$, by considering the value of x, find the approximate value of $\sqrt{7}$.

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(02) Mr. Senarath imports 500 mobile phones each Rs. 640 from a foreign country. 40% of duty is charged for mobile phones.

(i) Find the value of mobile phones including the duty.

(ii) The total cost for these mobile phones has been taken from a state bank to settle it in 20 monthly installments with the interest. When the annual rate of interest is 12% and the interest is calculated on reducing balance method, find the value of an installment with the interest.

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(03) (a) Simplify, $\begin{pmatrix} 2 & 4 \\ 1 & 5 \end{pmatrix} \begin{pmatrix} -3 & 2 \\ 1 & 0 \end{pmatrix}$

(b) Two hand bags and one pair of shoes cost Rs. 1000. The price of two pairs of shoes is Rs. 125 more than price of hand bag. By taking the price of a hand bag as Rs. *a* and the price of a pair of shoes is Rs. *b*, find the price of a hand bag and the price a pair of shoes by constructing a pair of simultaneous equations and by solving them.

(04) Rangana collects damaged irons as a business and sell them on a profit.

The following table provides the information of collected irons in metric tons during the last 25 days in a certain month.

Weight of irons (metric tons)	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Number of bags	1	4	7	6	4	3

(i) Write the modal class interval of the distribution.

(ii) Find the mean weight of iron collected in a day in kilograms (1 metric tone 1 = 1000kg)

(iii) Mr. Rangana settled Rs. 45000 as the Leasing installment for his vehicle from income of the above 25 days and the balance in hand is Rs. 316 200.

(a) Find the daily income of Mr. Rangana.

(b) Using the daily income of Mr. Rangana, find the selling price of 1kg of iron.

(05) The sum of areas of the base and the curved surface from outside of a hollow cylinder with the radius *a* units and height 4 units, is 52 , find the value of *a* to the nearest whole number by constructing a quadratic equation including *a*. Considering the value of *a* find the area of the base in square units. (Take $\sqrt{17} = 4.12$)

(06) (a) The teacher Piyawardana gave following instruction leafled relevant to an activity to a group of students.

Activity 01 - Required Materials

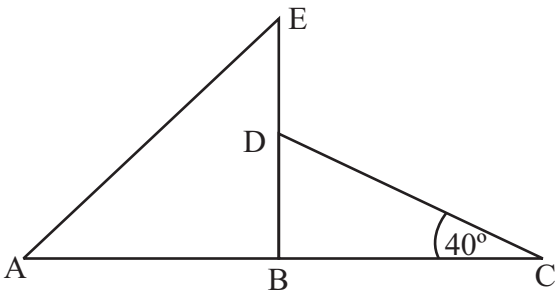
1. 1 measuring tape
2. 1 clinometer
3. 4 pegs
4. 1 compass
5. required amount of ropes

According to the instruction leaflet, students mark a point A on school ground and place Sanjeewa at A Sumith is placed at B which is 30m of distance from A on the bearing 080^0. Susantha is placed at (B) which is 30m of distance from A on the bearing 130^0.

(i) Draw a sketch by including the information of the activity done by students.

(ii) According to the figure drawn, find the bearing of Susantha seen by Sanjeewa.

(b) In the figure given, BE is a vertical post with the base B. 12m long iron wire joining midpoint D the post is fixed at C with 40º of alignment.



(i) Find the distance of BD by using trigonometric ratios.

(ii) Find the angle of elevation of observing the top of the post from the place A which locates 15m from B.

PART - B

(07) (a) Third term and fourth term of an arithmetic progression are 11 and 15 respectively.

(i) Write down first term and second term of the progression respectively.

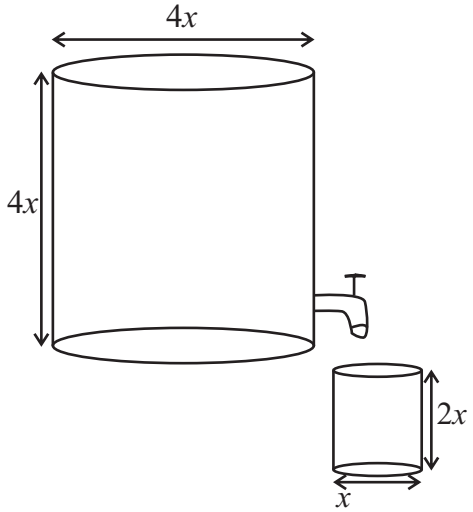
(ii) Obtain the n^{th} term of the above arithmetic progression in the simplest form.

(iii) Find the sum of first 18 terms in this arithmetic progression using the formula.

(b) How many terms should be taken to get the sum of terms as 189 of a geometric progression with the first term 3 and the common ratio 2?

(08) (a) The large cylinder with the diameter and the height of $4x$ is completely filled with water. Show that the volume of the large cylinder is equal to 32 times of the volume of small cylinder with the diameter x and the height $2x$.

(b) If the radius of the small cylinder is 3.25 cm, find its volume by using the logarithmic tables (=3.14)



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(09) Using only a straight edge with a cm/mm scale and a pair of compasses and showing the constructions lines clearly,

(i) Construct the triangle ABC such that AB = 8cm, BC = 7.2cm and $A\hat{B}C = 45^0$.

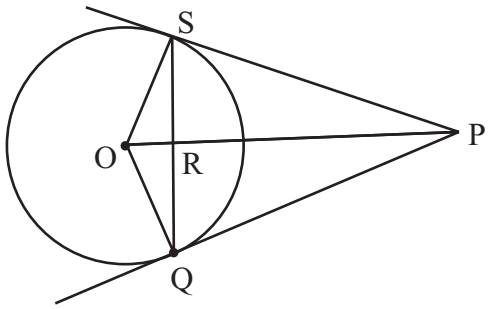
(ii) Construct a straight line parallel to BC through A.

(iii) Construct a circle with centre O such that it touches AB at A and passing through the point C.

(iv) Draw quadrilateral ACPQ such that the extended BC line meets the cirlce at P and the parallel line drawn in above (ii) meet the circle at Q.

(v) Give the circle theorem related for being $C\hat{A}B = A\hat{P}C$.

(10) Two tangent PQ and PS are drawn to a circle with the centre O from an exterior point M. Moreover straight lines PO and SQ are intersect at R.

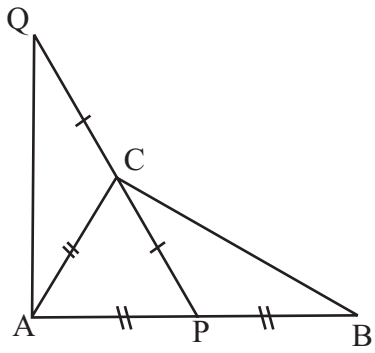


Prove that

(i) QS is perpendicular to OP.

(ii) $PQ^2 = PO^2 - PO.OR$

(11) P is the midpoint of the side AB in the triangle ABC. The straight line PQ is drawn such that PC = CQ.

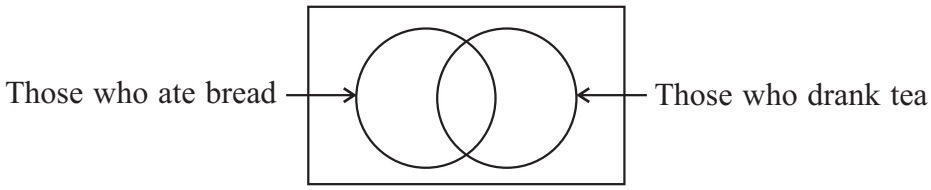


(i) Show that AQ = BC

(ii) Show that PBC is an isosceles triangle if $A\hat{Q}C = P\hat{B}C$.

(iii) Show that the quadrilateral APDQ is a parallelogram by producing the line AC to D such that AC = CD.

(12) 55 persons came to a restaurant for the breakfast. Out of them someone ate bread and someone drank tea. 35 of whom ate bread and 26 drank tea. Two persons did not eat bread or did not drink tea.



(i) Copy the given incomplete Venn diagram and include the given information.

(ii) All 24 males ate bread while number of males drank tea was 5. Redraw the given Venn diagram by including this information.

(iii) Shade the region belonging to females who ate bread and drank tea.

(iv) Find the number of females who did not eat bread.

වයඹ පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Department of Provincial Education - NWP

තෙවන වාර පරීක්ෂණය - 10 -11 ශ්‍රේණි - 2018

Third Term Test - Grade 10 -11 - 2018

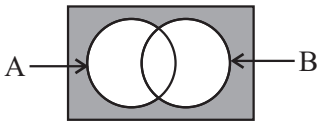
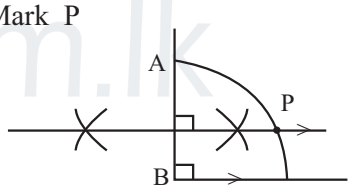
ගණිතය II

විෂයය Subject	විභාග අංකය Index No.	

විභාග ශාලාවෙන් පිටතට ගෙනයාම තහනම්. Not to be removed from the Examination Hall.

Answers

Part - A

01.	5 x 1.7		(02)
02.			(02)
03.	$\text{Log}_3 \frac{1}{9} = -2$		(02)
04.	$x = 4$ or $x = -4$ $x^2 = 16$ / $2(x^2 - 16) = 0$	01	(02)
05.	$x = 42^0$ $y = 42^0$	01 01	(02)
06.	20% $\frac{5}{25}$ x 100%	01 01	(02)
07.	$3l$ $50 \times 60 = 3000ml$	01	(02)
08.	$p = 42^0$ $q = 96^0$	01 01	(02)
09.	$\frac{2}{3}$		(02)
10.	9 Man days 18, 3 machine hours = 54 man days	01	(02)
11.	$A\hat{C}O = 50^0$ $A\hat{B}C$ 90º or $O\hat{C}B = 40^0$	01	(02)
12.	$P(A \quad B) = \frac{1}{6} + \frac{1}{3}$ $= \frac{1+2}{6}$ $= \frac{3}{6} = \frac{1}{2}$	01 01	(02)
13.	3.5 cm $2 \times \frac{22}{7} \times r = 22$	01	(02)
14.	Perimeter = 32cm BD = 5cm or DC = 13cm	01	(02)
15.	26 To identify 8 of 26 - 24	01	(02)
16.	$x = 48^0$		(02)
17.	$x = 1$ $y = x + 2$	01 01	(02)
18.	A. A. S.		(02)
19.	$(x - 2)(x + 4)$ $(x + 1)^2 - 3^2$	01	(02)
20.	2 $x < 3$	01	(02)
21.	$S\hat{Q}R = 110^0$ $B\hat{Q}S = 45^0$	01	(02)
22.	$(14 \times 14) - (\frac{22}{7} \times 14 \times 14 \times \frac{1}{4})$ 196 - 154 $42cm^2$	01 01	(02)
23.	 Reduce 1 mark if ✓mark for all boxes for two correct answers		(02)
24.	Perpendicular bisector Mark P 	01 01	(02)
25.	Sin ACB = $\frac{\sqrt{19}}{10}$ BC = 10cm	 01	(02)
			50

Part - B

01.	(i) Remaining portion = $\frac{1}{3}$ $= \frac{2}{3}$		(01)
	(ii) For sanitary purposes $= \frac{2}{3} \times \frac{3}{14}$ $= \frac{1}{7}$	 01 01	(02)
	(iii) $= \frac{1}{3} - \frac{1}{7}$ $= \frac{4}{21}$	01 01	

Answers

loan amount = $\frac{4}{21} \longrightarrow 20000$

$= \frac{20000}{4} \times 21$ 01

$=$ Rs. 10 50000 01 (04)

(iv) The value of the land

$= \frac{100}{70} \times 1050000$ 02

$=$ Rs. 1500000 01 (03)

10

02. (i) $\frac{45}{360} = \frac{1}{8}$ or correct equivalent fractions (01)

(ii) $= \frac{22}{7} \times 28 \times 28 \times \frac{1}{8}$ 01

$= 308m^2$ 01 (02)

(iii) AB $= \frac{308 \times 3}{28}$ 01

$= 33$ 01

$= 33 - 28$

$= 5m$ 01 (03)

(iv) Arc length EF $= 2 \times \frac{22}{7} \times 28 \times \frac{1}{8}$ 01

$= 22m$ 01 (02)

(v) Perimeter $= 33 + 28 + 28 + 28 + 5 + 22$ 01

$= 144m$ 01 (02)

10

03. (a) (i) Annual Income $= 55000 \times 12$

$=$ Rs. 660 000 (02)

(ii) Income Tax

$= 660\,000 - 500\,000$

$=$ Rs. 160 000 01

$= \frac{4}{100} \times 160\,000$ 01

$=$ Rs. 6400 01 (03)

(b) (i) No. of shares $= \frac{72\,000}{12}$ 01

$= 6000$ 01 (02)

(ii) (a) Capital gain $= 6000 \times 3$

$=$ Rs. 18 000 (01)

(b) Profit

$= (6000 \times 3.5) - 18000$

$=$ Rs. 3000 (02)

10

04. (a) (i) 5, 10 (02)

(ii) Correct rectangle of 10 - 15 01

Correct rectangle of 15 - 25 01 (02)

(iii) Correct frequency polygon 01

To identify 15-25 01

To mark end points 01 (02)

(b) (i) Total no. of students $= \frac{5}{30} \times 360$ 01

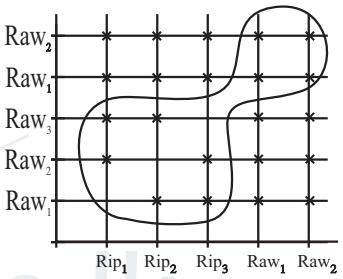
$= 60$ 01 (02)

(ii) No. of students who are not represented $= 60 - 55$ 01

$= 5$ 01 (02)

10

05. (a) (i)

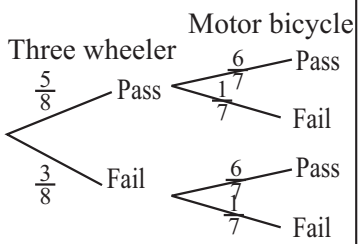


(02)

(ii) To circle the event 01

$\frac{10}{22} = \frac{5}{11}$ 01 (02)

(b)



(i) to mark probabilities 01

(ii) to extend the tree diagram and to mark probabilities 03 (04)

(iii) $\left(\frac{5}{8} \times \frac{1}{7}\right) + \left(\frac{3}{8} \times \frac{6}{7}\right)$ 01

$\frac{5}{56} + \frac{18}{56}$

$\frac{23}{56}$ 01 (02)

10

Answers

Part - II - A

01.

(i) 7 — 01

(ii) For correct scale — 01
to mark points — 01
for smoth curve correctly — 01 — 03

(iii) (a) $x = -1$ — 01
(b) (-1, 7) — 01 — 02

(iv) $-1 < x < 1.7$ — 02

(v) $y = 0$
$0 = \sqrt{7} - (x + 1)^2$
$\sqrt{7} = x + 1$ — 01
$= 1.7 + 1 = 2.7$ — 01 — 02

10

02.

(i) Import cost $= 640 \times 500$
$= 320\,000$ — 01

value after paying duty
$= \frac{140}{100} \times 320\,000$ — 01
$=$ රු. 448 000 — 01 — 03

(ii) loan amount $= 320\,000$
monthly loan amount
$= \frac{320\,000}{20}$
$= 16\,000$ — 01

Interest per one month unit
$= \frac{12}{100} \times 16000 \times \frac{1}{12}$ — 01
$= 160$ — 01

No. of month units $= \frac{20}{2}(20 + 1)$
$= 210$ — 01

Total interest $= 160 \times 210$
$= 33\,600$ — 01

Total amount $= 320\,000$
$33\,600$
$353\,600$

Value of an installment $= \frac{353\,600}{20}$ — 01
$=$ රු. 17 680 — 01 — 07

10

03.

(a) $\begin{pmatrix} -6+4 & 4+0 \\ -3+5 & 2+0 \end{pmatrix}$ — 02

$\begin{pmatrix} -2 & 4 \\ 2 & 2 \end{pmatrix}$ — 02 — 04

(b) $2a + b = 1000$ ——— ①
$-a + 2b = 125$ ——— ② — 02
②x 2 $-2a + 4b = 250$ ——— ③ — 01
①+③ $5b = 1250$
$b = 250$ — 01 — 04

$b = 250$ substitute in ①
$2a + 2b = 1000$
$2a + 250 = 100$
$2a = 750$
$a = 375$ — 01

Price of a hand bag = Rs. 375
Price of a pair of shoes = Rs. 250 — 01 — 02

10

04.

(a) (i) 0.9 - 1.1 — 01

(ii)

Class interval	Mid value	f	fx
0.3-0.5	0.4	1	0.4
0.6-0.8	0.7	4	2.8
0.9-1.1	1.0	7	7.0
1.2-1.4	1.6	6	7.8
1.5-1.7	1.6	4	6.4
1.8-2.0	1.9	3	5.7
		$f = 25$	$fx = 30.1$

Meen $= \frac{fx}{f}$
$= \frac{30.1}{2.5}$ — 01
$= 1.204 \times 1000$
$= 1204$ kg — 01

For mid value column — 01
For fx column — 01
For fx — 01 — 05

(iii) Mean daily income
$= \frac{(316200 + 45000)}{25}$
$= \frac{361200}{25}$ — 01
$= 14\,448$ — 01 — 02

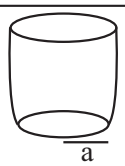
(b) Price of 1kg of iron $= \frac{14\,448}{1\,204}$ — 01
$=$ Rs. 12 — 01 — 02

10

Answers

Part - II - A

05.



$a^2 + 2\ a \times 4 = 52$ — 01

$(a^2 + 8a) = 52$

$a^2 + 8a = 52$ — 01

$a^2 + 8a + 16 = 52 + 16$ — 01

$(a + 4)^2 = 68$

$a + 4 = \pm 2\sqrt{17}$ — 01

$a + 4 = \pm 2 \times 4.12$

$a + 4 = \pm 8.24$ — 01

$a = 8.24 - 4$ or $a = -8.24 - 4$ — 01

$a = 4.24$ $\quad a = -12.24$ — 01

$> a$

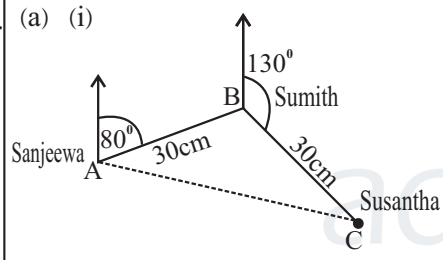
$a = 4.2$ — 01 — (08)

Base area $= \frac{22}{7} \times 4.2 \times 4.2$ — 01

$= 55.44$ square units — 01 — (02)

10

06. (a) (i)



— 02

(ii) $A\hat{B}C = 360 - (100 + 130)$

$= 360 - 230$

$= 130^0$ — 01

$BAC = 180 - 130$

$= \frac{50}{2}$

$= 25^0$

Bearing $= 080 + 025$

$= 105^0$ — 01 — (02)

(b) (i) $\sin 30 = \frac{BD}{12}$ — 01

$0.5 = \frac{BD}{12}$ — 01

$0.5 \times 12 = BD$

$6m = BD$ — 01 — (03)

(ii) $\tan = \frac{12}{15}$ — 01

$\tan = 0.8$ — 01

$= \tan^{-1} 0.8$

$= 38^o\ 7'$ — 01 — (03)

10

07. (i) 3, 7 — (01)

(ii) $3 + (n - 1)\ 4$

$3 + 4n - 4$ — 01

$4n - 1$ — 01 — (02)

(iii) $S_n = \frac{18}{2} \{2 \times 3 + (18 - 1)4\}$ — 01

$= 9\ (6 + 17 \times 4)$

$= 9 \times 74$ — 01

$= 666$ — 01 — (03)

(iv) $189 = \frac{3(2^n - 1)}{2 - 1}$ — 01

$189 = 3(2^n - 1)$

$63 = 2^n - 1$ — 01

$64 = 2^n$

$2^6 = 2^n$ — 01

$6 = n$ — 01 — (04)

10

08. (i) Volume of large cylinder

$= r^2h$

$= \pi (2x)^2 \times 4x$ — 01

$= 16\ \pi x^2$ — 01

Volume of small cylinder

$= r^2h$

$= \left(\frac{x}{2}\right)^2 \times 2x$

$= \frac{x^3}{2}$ — 01

No. of times to be filled

$= 16\ \pi r^3 \quad \frac{x^3}{2}$ — 01 — (04)

$= 32$

(i) Volume of small cylinder

$= \frac{x^3}{2}$

$= \frac{3.14 \times (3.25)^3}{2}$

$= (\log 3.14 + 3\log 3.25) = \log 2$ — 01

$= (0.4969 + 3 \times 0.5119) - 0.3010$ — 03

$= (0.\ 4969 + 1.5357) - 0.3010$ — 01

$= 2.0326 - 0.3010$

$= 1.7316$ — 01

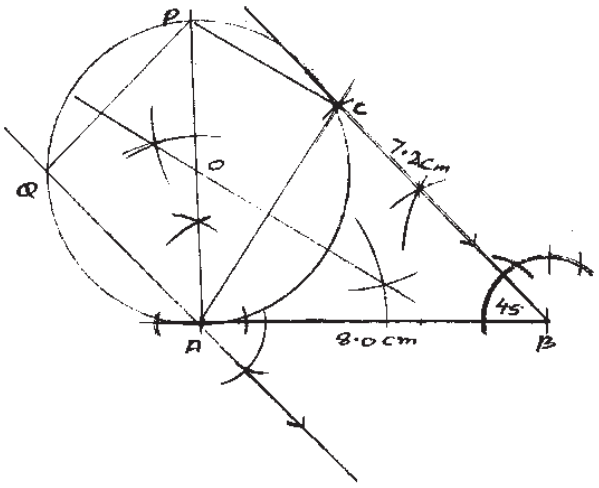
$=$ antilog 1.7316

$= 53.9$ — 01 — (06)

10

Answers

09.



(i) Constructing AB 01
Constructing $A\hat{B}C = 45^0$ 01
Constructing ABC△ 01 (03)

(ii) Constructing parallel line (01)

(iii) Constructing perpendicular at A to AB 01

Perpendicular bisector of AC 01

To construct the circle with centre O 01 (03)

(iv) Constructing quadrilateral ACPQ (01)

(v) The angle between the chord and the tangent is equal to angle on the alternate segment (02)

10

10 (i) TTP : QS ⊥ OP

Proof of : OSR△ and ORQ△

OS = OQ (radii)

$S\hat{O}R = Q\hat{O}R$ (the angle subtended by tangents at the centre)

OR = OR (Common side)

∴ OSR△ ≡ OQR△ (SAS) ..... (03)

$S\hat{R}O = O\hat{R}Q$ (Corresponding properties of congruent△s) ..... (01)

$S\hat{R}O + Q\hat{R}S = 180^o$ (Supplementary adjacent angles)

$S\hat{R}O = O\hat{R}Q = 90^o$ ..... (01)

∴ OP ⊥ OP or other method of proof

(ii) TTP : $PQ^2 = PO^2 - PO.OR$

Prrf : OQP△ and PRQ△

$O\hat{Q}P = Q\hat{R}P$ (90°)

$O\hat{P}Q = R\hat{P}Q$ (Common side)

$Q\hat{O}P = R\hat{Q}P$ (Sum of interior angles of a △)

∴ OQP△ and PRQ△ are equi - angular ..... (02)

$\frac{PO}{PQ} = \frac{PQ}{RP}$ ..... (01)

$PQ^2 = PO.RP$

$RP = PO - OR$ ..... (01)

$PQ^2 = PO.(PO-OR)$ ..... (01)

$PQ^2 = PO^2 - PO \,.\, OR$

10

Answers

11. (i) TTP:- AQ = BC

Prrof :-

$A\hat{C}P = A\hat{P}C$ (AC = AP) — 01

$A\hat{C}Q = 180 - A\hat{C}P$ } (Supplementary adjacent ∠s)

$B\hat{P}C = 180 - A\hat{P}C$ } — 01

$A\hat{C}Q = B\hat{P}C$ — 01 — (03)

AQC and PCB

QC = CP (data) — 01

AC= PC (data) — 01

$A\hat{C}Q = B\hat{P}C$ (proved)

AQC PCQ (SAS)

AQ = BC (Corresponding properties of congruent s) — 01 — (03)

(ii) $A\hat{Q}C = B\hat{C}P$ (Corresponding properties of congruent s) — 01

$A\hat{Q}C = P\hat{B}Q$ (data)

$\therefore B\hat{C}P = P\hat{B}Q$

$\therefore$ BP = PC — 01 — (02)

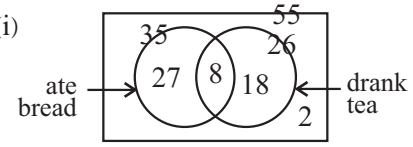
BPC is an isosceles

(iii) To mark D — 01

Because of diagonals bisect — 01 — (02)

10

12. (i)



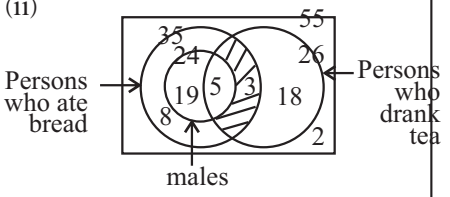
(35 + 26) - 53

61 - 53

8

To mark 27, 8, 18 — (03)

(ii)



For set of males — (01)

To mark 8, 19, 5, 3 — (04)

(iii) To shade the region — (01)

(iv) 18 + 2

20 — (01)

10