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**Royal College - Colombo 07**

වර්ෂ අවසාන ඇගයීම - 2021  
Year End Evaluation - 2021

Grade - 9

Mathematics

Time - 02 hours

Name : ..... No : ..... Class : .....

Part I

- Answer *all* questions on this paper itself
- Each question carries *two* marks.

01. Find the common difference of the number pattern 20, 17, 14, 11, .....

02. Find the 8<sup>th</sup> term of the number pattern with general term  $T_n = 21 - 3n$

03. Convert the binary number  $10110_{\text{two}}$  into decimal numbers

04. Fill in the blanks

$$\begin{array}{r} 1101_{\text{two}} \\ 11\boxed{\phantom{0}}_{\text{two}} \\ \hline 1\boxed{\phantom{0}}100_{\text{two}} \end{array}$$

05. Simplify:  $\frac{1}{3} + \frac{2}{3} \div \frac{2}{6}$

06. Write down the reciprocal of  $2\frac{3}{5}$

07. Saman who owns  $\frac{3}{4}$  of bunch of mangoes, gives  $\frac{1}{3}$  to his friend Nimal. What is the portion received by Nimal as a fraction of the whole.

08. A vendor buys a shirt at Rs. 500 and sells it at Rs.600. Calculate the profit percentage earned by the vendor.

09. Fill in the blanks.

$$\begin{aligned}(x+5)(x-3) &= x(x-3) + 5(x-3) \\ &= x^2 - \boxed{\phantom{00}} + 5x - 15 \\ &= x^2 + \boxed{\phantom{00}} - 15\end{aligned}$$

10. Find the factors of the following algebraic expression

$$kx - 8k + 3x - 24$$

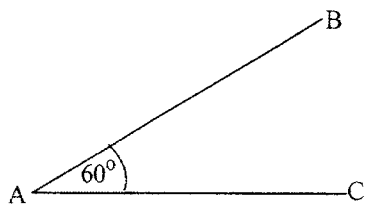
11. The area of the cross section is  $300 \text{ cm}^2$  of a cuboid shape vessel. If the vessel is filled up to a height of 20 cm, find the volume of water in the vessel in  $\text{cm}^3$  and l.

12. Write down two integrals which satisfy the inequality  $x > 3$ .

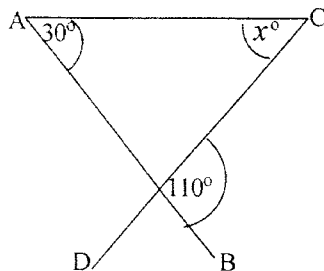
13. Simplify and write the answer with positive indices  $\left(\frac{3x}{2y}\right)^{-3}$

14. Write 0.00123 in scientific notation.

15. Draw a rough sketch of the locus of points equidistant from the straight line  $AB$  and  $AC$ .



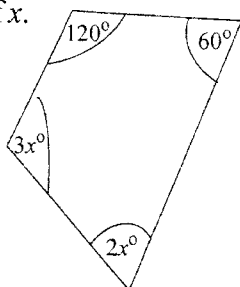
16.  $AB$  and  $CD$  are two straight lines. Find the values of  $x$ .



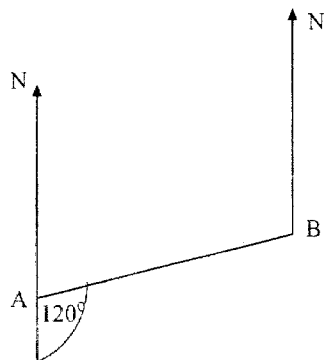
17. Make  $n$  the subject of  $\ell = a + (n-1)d$

18. Write down the gradient and intercept of the graph of the function  $2y = 3x - 4$

19. Find the value of  $x$ .



20. Write down the bearing of  $A$  from  $B$ .





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Mathematics

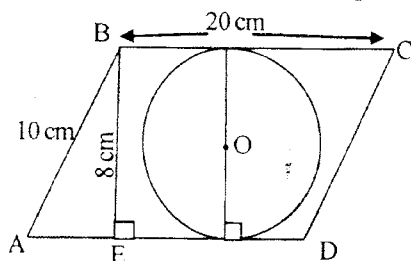
Name : ..... No : ..... Class : .....

Part II

- \* Answer the first question and **another 04** questions.  
 \* First question carries 16 marks and other questions carry 11 marks each.

01. Recollect your memory on the assessment done in the lesson 'Area' and answer the following questions.

(i) Write down the names of two plane figures of which you found the areas in the lesson.



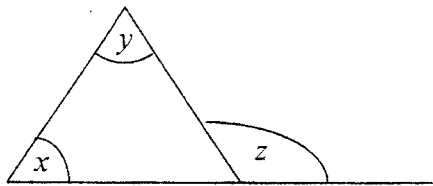
In  $ABCD$  parallelogram, the side  $AD$  is perpendicular to  $BE$ . There is a circle with center  $O$  located inside the parallelogram and which touches two parallel sides  $AD$  and  $BC$  of the parallelogram.

Copy the above figure into your answer script and,

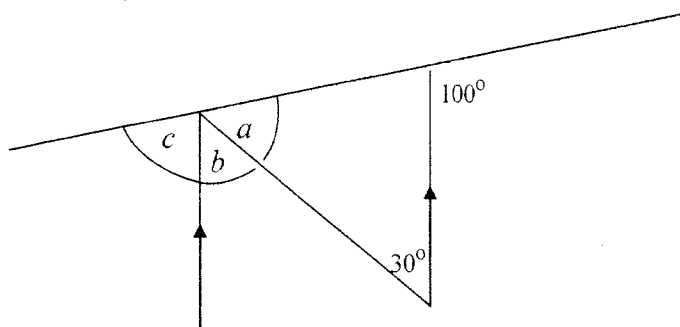
- (ii) Find the area of the parallelogram  $ABCD$ .
  - (iii) Show that the length of the side  $AE$  is 6 cm by using Pythagorean relation.
  - (iv) Find the area of the triangle  $ABE$ .
  - (v) Write down the name of the polygon  $BCDE$  and find its area.
  - (vi) Find the radius of the circle with center  $O$ .
  - (vii) Find the area of the circle to the nearest whole number by taking  $\pi = \frac{22}{7}$ .
02. (a) Simplify and express the answer in its simplest form  $\frac{3}{4} + \frac{3}{4}$  of  $\left(\frac{4}{5} + \frac{3}{5}\right)$
- (b) A vendor buys an item for Rs. 5 000 and marks its price so that he earns a profit of 20%. When selling the item, if the payment is done outright, a discount of 5% is offered.
- (i) Find the marked price of the item.
  - (ii) Find the profit which the seller earns if the payment is done outright.
  - (iii) Find the discount that customer receives.
  - (iv) Find the profit percentage after offering the discount to the customer.

3. (a)  $\in = \{\text{Whole numbers from 1 to 10}\}$   
 $A = \{\text{Odd numbers from 1 to 10}\}$   
 $B = \{\text{Prime numbers from 1 to 10}\}$
- (i) Write down the sets A and B in terms of their elements.  
(ii) Represent the above data in a Venn diagram.  
(iii) Based on the Venn diagram, write each of the following sets in terms of its elements.
- (a)  $A \cap B$   
(b)  $(A \cup B)^c$
- (b) A bag contains 3 red balls and 2 yellow balls of the same size and shape. Randomly drawing a ball from the bag and recording its colour.
- (i) Write the sample space of this experiment.  
(ii) Find the probability of drawing a red ball.  
(iii) Find the probability of drawing a yellow ball.
4. (i) Solve the following equations.
- (a)  $\frac{a}{2} + \frac{a}{3} = 5$  (b)  $2\{3(x+1) + x\} - 5 = 9$
- (ii) Solve the pair of simultaneous equation.
- $$4x - 2y = 10$$
- $$3x + 2y = 4$$
- (iii) Find the value of  $5 - 6x$  when  $x = \frac{1}{2}$ .
5. Use only a straight edge with a cm/mm scale and a pair of compasses for the following constructions. Show your construction lines clearly.
- (i) Construct the triangle ABC such that  $AB = 6$  cm  $\hat{BAC} = 90^\circ$  and  $\hat{ABC} = 60^\circ$ .  
(ii) Construct the angle bisectors of  $\hat{ABC}$  and  $\hat{ACB}$ .  
(iii) Name the point of intersection of above (ii) as O and construct a perpendicular from O to straight line AB.  
(iv) Name the intersection points of AB and perpendicular as D.  
(v) Construct a circle taking OD as the radius and O as the centre.

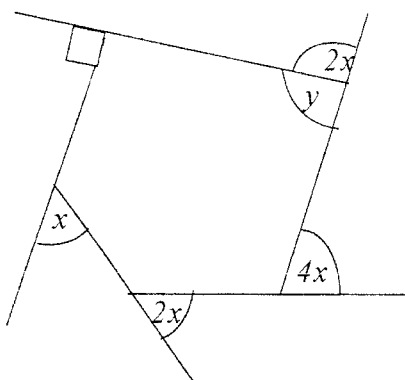
6. (a) (i) Based on the given information, build a relationship between  $x$ ,  $y$  and  $z$ .



- (ii) Copy the following figure into your answer script. Based on the given information, find the value of  $a$ ,  $b$  and  $c$ .



- (b) The following figure shows the magnitudes of the exterior angles of a pentagon.



- (i) What is the value of  $x$  in degrees?  
(ii) Find the value of  $y$  by using  $x$ .

7. The masses of 20 limes are given below (Mass in grams)

28	26	28	30	25
27	29	26	29	29
26	25	28	24	27
24	25	24	30	25

- (i) Find the range of the above set of data.
- (ii) The following ungroup frequency distribution prepared using the above information. Copy it into your answer script and complete it.

Mass of a lime (g) – $x$	No. of limes $f$	$f \times x$
24	.....	.....
25	.....	.....
26	.....	.....
27	.....	.....
28	.....	.....
29	.....	.....
30	.....	.....
	Sum of $f =$	Sum of $f x =$

- (i) What is the mode of the above data?
- (ii) Find the median of the data?
- (iii) Find the mean mass of a lime to the nearest whole number.

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