Grade 9 First Term Test - **2019** **32 E**

Name..... **Mathematics - I** **2 ½ hours**

Important :
- **Answer all questions**
- **Each question will be given by 2 marks**

- **Answer all the questions on the paper itself**

(01) Simplify. $6 + 5 \times \frac{3}{5}$

(02) Expand the expression.

$2x\ (3r - 5)$

(03) If a student obtains 30 out of 40 marks for a mathematics paper, what is the percentage of the mark he obtained?

(04) What is the complementary angle of 35^0 ?

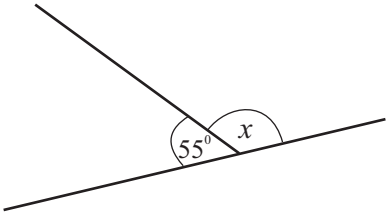
(05) Fill in the blanks.

$3\ (x+1) - xa - a$

$3\ (x+1) - a$ (.....)

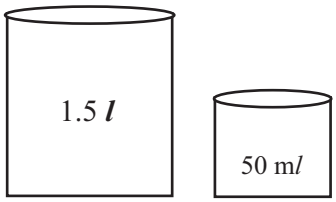
(.....) (.....)

(06) Find the value of x.



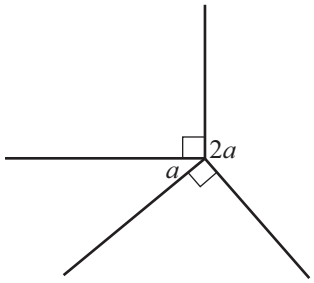
(07) If a broker should be paid 2% of a land which was sold at, Rs. 500 000, How much does the land owner receive?

(08)

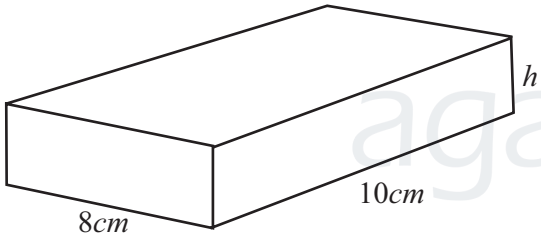


How many times should water be poured in to the container of capacity 1.5l, from the completely filled container of capacity 50 ml ?

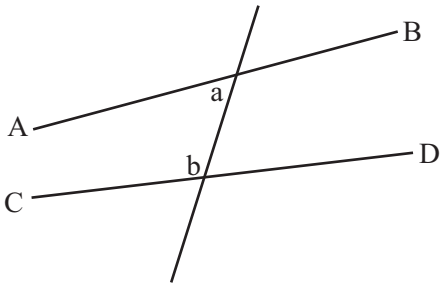
(09) Find the value of a.



(10) If the total amount of liquid that can be put in to the container is 400 ml, find the value of h.



(11) Write the relationship between a and b, if it needs AB parallel to CD.



(12) Dasun has Rs. 1200. He gave $\frac{2}{3}$ of it to his younger brother. Find the amount of money he gave to younger brother.

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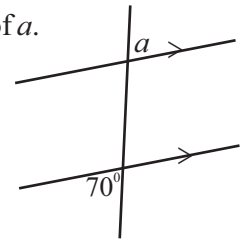
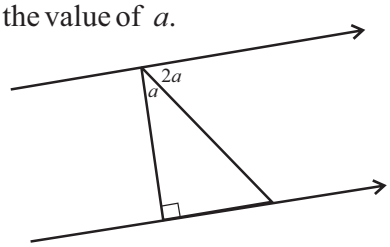
(13) Find the value of a.



(14) If a trouser worth Rs. 2000.00 is sold at a loss of 10%, calculate the selling price of the trouser.

(15) If $AC = BD$, show that $AB = CD$.

(16) Find the value of a.



(17) A bag contains 3 buttons of blue colour, 2 of black and 1 white colour button. One button is taken out of the bag randomly. Find the probability of it being a blue button.

(18) Find the value of following with the knowledge of factors.

$101^2 - 1^2$

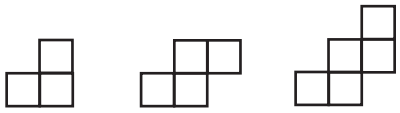
(19) Find the value of $(-2)^5$

(20) Find the median of following data set 8,2,7,5,6,3,2,4,4,9,8

Part II

- **Answer five questions including first question.**

(01) (a)



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i. Above diagram is a set patterns constructed using match sticks. It is started with 10 matches. Draw the fourth pattern. (2 marks)

ii. Considering the number of matches used to construct each pattern, develop the number pattern. (2 marks)

iii. What is the difference between two consecutive numbers in above constructed pattern? (1 mark)

(b) Following is an incompleted note, which could be used to find the general term of the number pattern, 6, 10, 14, 18

1^{st} term -> $6 = 4 \times 1 + ...$

2^{nd} Term -> $10 = 4 \times ..... + 2$

3^{rd} Term -> $14 = ... \times ..... + ...$

4^{th} term -> $18 = ... \times ..... + ...$

10^{th} term -> $T_{10} = ... \times ..... + ...$

n^{th} term -> $T_n = ... \times ..... + ...$

i. Copy the above note to your answer script and fill the blanks with suitable values. (5 marks)

ii. Using the above note, show that the general term of the number pattern is, $T_n = 2(2n+1)$ (2 marks)

(c) The general term of a number pattern is $T_n = 6n - 1$

i. Which term is equal to 125? (2 marks)

ii. Write the $(n+1)^{th}$ term, using n (2 marks)

(02) a. Simplify.

i. $\frac{3}{5} \times \frac{5}{7} \times 1\frac{5}{9}$ (2 marks)

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ii. $1\frac{2}{3} \times \frac{1}{17} \left(\frac{2}{7}+\frac{1}{5}\right)$ (3 marks)

(b) $\frac{2}{3}$ of mangoes were sold and another $\frac{1}{5}$ were rotten, of 1500 mangoes.

i. What is the total fraction of sold and rotten mangoes from the whole? (1 mark)

ii. What is the fraction remained from the whole? (1 mark)

iii. If $\frac{1}{2}$ of remained mangoes were ripen, what is the fraction of ripen mangoes from the whole? (2 marks)

iv. What is the number of ripen mangoes ? (2 marks)

(03) (a) Find the value of following algebraic expressions when, a = -2, b = 3, c= -3 .

i. 2b -1 (2 marks) ii. $2a-\frac{1}{3}c$ (2 marks)

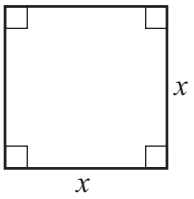
b. Length of the side of the given square is x

(i) Draw the rough sketch of the rectangle, constructed by increasing the length by 2 units and decreasing the width by 1 unit. Mark the length and the width on the sides of it.($x>1$) (2 marks)

(ii) Write the area of the rectangle as a product of binomial expressions. (1 mark)

(iii) Expand the binomial expression you obtained in (ii). (2 marks)

(iv) Verify the above expression for $x=3$. (2 marks)



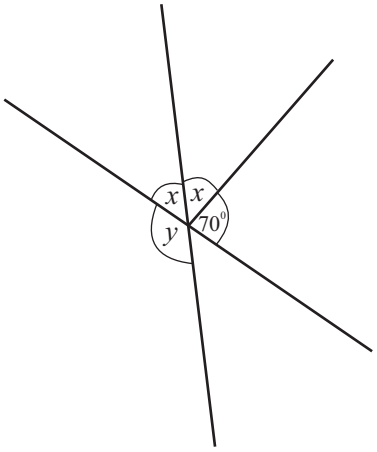
(04) (a) Write the following algebraic expressions as a product of two factors.

i. $5 - 10x$ (1 mark)
ii. $x^2+3x+4x+12$ (2 marks)
iii. $a^2+ 5a - 2a + 10$ (2 marks)

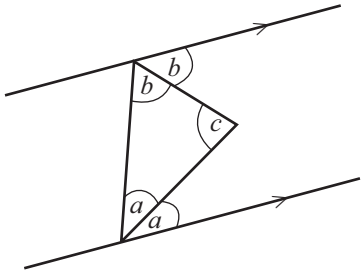
(b) Factorize following algebraic expressions.

i. $x^2 - 3x - 10$ (3 marks)
ii. $20a^2 - 5b^2$ (3 marks)

(05) Find the values of x and y. (4 marks)



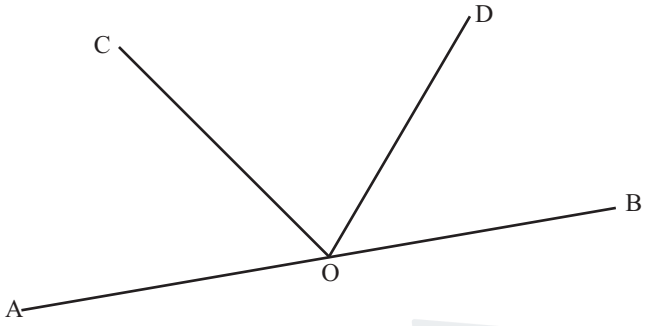
(b)



i. Find the value of a+b (2 marks)

ii. Find the value of c (2 marks)

(c)



In the above diagram $A\hat{O}C = B\hat{O}D$

Show that, $A\hat{O}D = B\hat{O}C$. (3 marks)

(06) a. i. Write 37 as a binary number. (2 marks)

ii. Write 10101_{two} as a decimal number. (2 marks)

iii. Find the value.

$10101_{two} + 1111_{two} + 101_{two}$ (2 marks)

iv. Find the value.

$10001_{two} - 1111_{two}$ (2 marks)

(b) Capacity of a water bowser belongs to the fire brigade is 6000 *l*.

i. Find the capacity of the water bowser in cubic meters (m^3). (1 mark)

ii. If a rectangular shaped tank having the base area $3m^2$ was poured by the completely filled water bowser, what will be the height of the water level in the tank. (2 marks)

(07) (a) Vendor bought 1500 avocados for Rs. 7500.00. He sold a bag of avocados 10 in each, for Rs. 80.00

i. Find the selling price of whole avocados. (2 marks)

ii. Calculate the percentage of profit he obtained. (3 marks)

(b) Price of an electric item is Rs. 24000 when it is issued from the factory. Vendor marks its price with 30% profit. When selling the item, 5% discount is given.

i. What is the marked price of the item? (2 marks)

ii. How much is the discount ? (2 marks)

iii. At what price customer buys it? (2 marks)

First Term Test - 2019

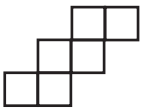
Mathematics

Grade 9

Answer Sheet Part - I

Q.No.	Answer	Marks		Q.No.	Answer	Marks	
01	9 $6+5 \times \frac{3}{5}$	01	02	13	$a = 70^0$		02
02	$6xr - 10x$		02	14	Rs. 1800 $\frac{10}{100}$ x 2000	01	02
03	75% $\frac{30}{40}$ x 100	01 01	02	15	AC = BD AC - BC = BD - BC AB = CD	01 01	02
04	55^0		02	16	$a = 30^0$ $3a + 90 = 180^0$	01	02
05	(x+1) (x+1) (3-a)	01 01	02	17	$\frac{1}{2}$ $\frac{3}{6}$	01	02
06	125^0 $x + 55^0 = 180^0$	01 01	02	18	(101 - 1) (101 + 1) 100 x 102 10200	01 01	02
07	Rs.490 000 $\frac{2}{100}$ x 500 000 or 10000	01 01	02	19	-32 -2 x -2 x -2 x -2 x -2 x -2	01	02
08	30 $\frac{1500}{50}$	01 01	02	20	6 preparation in ascending order	01	02
09	$a = 60^0$ $3a + 90 + 90 = 360^0$	01	02				
10	5 cm 10x8 x h = 400	01	02				
11	$a + b = 180^0$		02				
12	Rs. 800 $1200 \times \frac{2}{3}$	01	02				

Answer Sheet Part - II

Q.No	Answer	Marks	
(01)	(a) I. 		02
	ii. 10, 13, 16, 19, 22		02
	iii. 3		01
	(b) i. 1st term → 6= 4 x 1+2	01	
	2nd Term → 10 = 4 x 2+2	01	
	3rd Term → 14 = 4 x 3+2 }	01	
	4th Term → 18 = 4 x 4+2 }		
	10 th Term ⟶ T10 = 4 x 10 + 2	01	
	n th Term ⟶ Tn = 4 x n+ 2	01	05
	ii. Tn = 4n + 2		
	Tn = 2 (2n+1)	02	02
	(c) i. Tn = 6n -1		
	125 = 6n -1	01	
	125+1 = 6n		
	6n = 126		
	n = 21, 21st Term	01	02
	ii. Tn = 6n - 1		
	Tn+1 = 6 (n+1) -1	01	
	Tn+1= 6n + 6-1		
	Tn+1 = 6n +5	01	02
			16
(02)	(a) I. $\frac{3}{5} \times \frac{5}{7} \times 1\frac{5}{9}$		
	$\frac{\cancel{3}}{\cancel{5}} \times \frac{\cancel{5}}{\cancel{7}} \times \frac{\cancel{14}^{2}}{\cancel{9}_{3}}$	01	
	$\frac{2}{3}$	01	02
	ii. $1\frac{2}{3} \times \frac{1}{17}\left(\frac{2}{7}+\frac{1}{5}\right)$		
	$\frac{5}{3} \times \frac{1}{17} \times \left(\frac{17}{35}\right)$	02	
	$\frac{1}{21}$	01	03

Q.No	Answer	Marks	
	(b) i. $\frac{2}{3}+\frac{1}{5}$		
	$\frac{13}{15}$		01
	ii.		
	$1-\frac{13}{15}=\frac{2}{15}$		01
	iii.	01	
	$\frac{1}{2}$ of $\frac{2}{15}$	01	
	$\frac{2}{15} \times \frac{1}{2}$		
	$\frac{1}{15}$		02
	iv.	01	
	$1500 \times \frac{1}{15}$	01	
	100 mangoes		02
			11
(03)	(a) i. 2b - 1		
	2 x 3 - 1	01	
	6 - 1	01	02
	5		
	ii. 2 (-2) - $\frac{1}{3}$ (-3)	01	02
	-4 + 1		
	-3	01	
	(b) i.		
	 x -1		02
	ii. (x-1) (x+2) x + 2		01
	iii. x (x+2) -1 (x+2)	01	
	$x^2 + 2x - x - 2$		
	$x^2 + x - 2$	01	
	iv. (x-1) (x+2) = $x^2 + x - 2$		02
	(3-1) (3+2) = $3^2 + 3 - 2$	01	
	10 = 10	01	
			02
			11

Q.No.	Answer	Marks		Q.No.	Answer	Marks	
(04)	(a) i. $5(1 - 2x)$		01	(07)	(a) i. number of bags = 150	01	02
	ii. $x(x+3) + 4(x+3)$	01			selling price = Rs. 150 x 80		
	$(x+3)(x+4)$	01	02		= Rs. 12000	01	
	iii. $a(a-5) - 2(a-5)$	01			ii. Profit = Rs. 4500		01
	$(a-5)(a-2)$	01	02		Profit percentage $= \frac{4500}{7500} \times 100\ \%$	01	
					$= 60\%$		02
	(b) i. $x - 5x + 2x - 10$	01				01	
	$x(x-5) + 2(x-5)$	01			(b) i. $\frac{130}{100} \times 2400$	01	
	$(x-5)(x+2)$	01	03				02
	ii. $20a^2 - 5b^2$				Rs. 31200	01	
	$5(4a^2 - b^2)$	01			ii. $\frac{5}{100} \times 31200$	01	
	$5((2a)^2 - b^2)$	01			Rs. 1560	01	02
	$2(2a - b)(2a + b)$	01	03		iii. $\frac{95}{100} \times 31200$	01	
			11		Rs. 29640	01	02
(05)	(a) $2x + 70^0 = 180^0$	01	02				11
	$x = 55^0$	01					
	$x+y = 180^0$	01					
	$55^0 + y = 180^0$						
	$y = 125^0$	01	02				
	(b) $2a + 2b = 180^0$	01					
	$(a+b) = 90^0$	01	02				
	$a + b + c = 180^0$						
	$90^0 + c = 180^0$	01					
	$C = 90^0$	01	02				
	(c) $A\hat{O}C = B\hat{O}D$ (given)						
	$A\hat{O}C + C\hat{O}D = B\hat{O}D + C\hat{O}D$ (by axiom)						
	$A\hat{O}D = B\hat{O}C$						
	for suitable proving method		03				
(06)	(a) i. $37_{ten} = 100101_{two}$		02				
	ii. $10101_{two} = 1+0+4+0+16$	01					
	$= 21_{ten}$	01	02				
	iii. 10101_{two}						
	$+ \quad 1111_{two}$						
	$\quad 101_{two}$						
	101001_{two}		02				
	iv. 10_{ten}		02				
	(b) i. $6000\,l = 6m^3$	01					
	if the water level is 'h'	01	01				
	ii. $3h = 6$	01					
	$6 = 2m$ (water level 2ml)	01	02				
			11				