HOLIDAY ASSIGNMENT

MATHEMATICS

2024 DECEMBER

WEEK 1

SECTION A: 40MKS

1) Evaluate $\frac{-4 \text{ of } (-4 + -15 \div 5) + -3 - 4 \div 2)}{84 \div -7 + 3 - - 5}$ (3mks)

2) Express the following numbers in terms of their prime factors.(2mks)

196

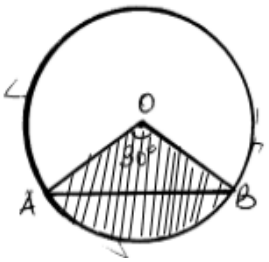
3)Three tanks are capable of holding 36, 84 and 90 litres of milk. Determine the capacity of the greatest vessel which can be used to fill each one of them an exact number of times. (2 mk)

4) The cost of 5 skirts and 3 blouses is sh. 1750. Mueni bought three of the skirts and one of the blouses for sh.850. Find the cost of each item. (3 mks)

2) Forty five men can construct a road 210m long in 60 days. What length would be constructed by 72 men in 50 day assuming that all work at the same rate? (3mks)

3) Using tables to find the Square root of 0.146 (2mks)

4) The figure below shows a circle centre O. ChordAB subtends 30^0 at the centre. If the area of the shaded section is $5.25cm^2$, find the radius of the circle $\left(Take\ \pi = \frac{22}{7}\right)$ (3mks)



5) Juma, Ali and Hassan share the profit of their business in the ratios 3:7: 9 respectively. If Juma receives Ksh 60000. How much profit did the business yield? (2mks)

WEEK 2

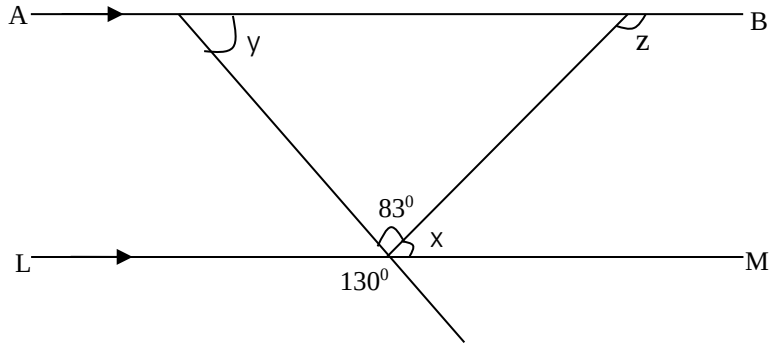
6) The exterior angle of a regular polygon is an eighth of the interior angle. How many sides does the regular polygon have? (3 marks)

7) Express each of the following as a fraction; (2 mks)

$3.\dot{7}\dot{2}$

8) Find the ratio of x: z if x: y=9:10 and y:z=5:3. (3mks)

9) In the figure below, lines AB and LM are parallel.



(a) Find the values of the angles marked x, and z. (2 mks)

10) Solve for y in the following equation;(3mks)

$$\frac{y+3}{3}+\frac{y-3}{4}=\frac{1}{12}$$

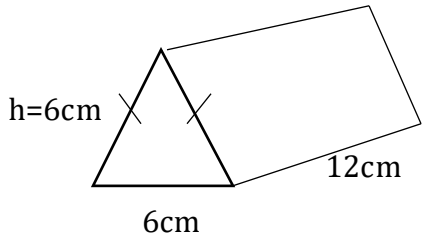
11) A Kenyan company received US Dollars 100,000.The money was converted into Kenya shillings in a bank which buys and sells foreign currencies as follows:

	Buying (in Kenya shillings)	**Selling** (in Kenya shillings)
1 US Dollar	77.24	77.44
1 Sterling Pound	121.93	122.27

Calculate the amount of money, in Kenya shillings, the company received. (3mks)

12) The diagram below show a triangular prism.

Find the surface area of the prism. 5mks



WEEK 3

SECTION II*(Answer ALLquestions in this section)*

13) The table below shows a time table for a public surface vehicle operating between two towns A and D via town B and C.

town	Arrival time	Departure time
A		8:20am
B	10:40pm	11:00am
C	2:30 pm	2:50pm
D	4:pm	

(i) At what time in 24hour clock system:

a) The vehicle leaves town A. 2mks

b) The vehicle arrives in town D. 2mks

c) How long does it take to travel from town A to D. 4mks

d) If the distance between the two towns A and D is 900km, find the average speed of the vehicle. 2mks

14) (a) The table below shows measurements, in metres, made by a surveyor in his field book. Using a scale of 1cm to represent 20m construct a diagram to represent this information. (5mks)

	G	
F50	280	
	250	
	200	E40
	150	D100
C120	100	
	40	B50
	A	

(b) Calculate the area of the above piece of land in hectares. (5mks)

17) Use a ruler and a pair of compasses only in this question.

(a) Construct triangle ABC in which AB = 7 cm, BC = 8 cm and $\angle ABC = 60^0$. (4mks)

(b) Measure (i) side AC. (1mk)

(ii) $\angle$ ACB. (1mk)

(c) On the same diagram, drop a perpendicular from C to meet AB at D. Measure CD hence calculate the area of the triangle (4mks)

WEEK 4

SECTION I(40 MARKS)

ANSWER ALL QUATIONS IN THIS SECTION

1. Find the equation of a line through point (5, -1) and perpendicular to line $4x + 2y – 3 = 0$.

(3mks)

2. Two spheres have surface areas of $36cm^2$ and $49cm^2$. If the volume of the smaller sphere is $20.2cm^3$calculate the volume of the larger one. (3 mks)

3. Find the integral values of x which satisfy the following inequality.

$6 – 3x \leq 2x – 4 < x + 1$ (3

marks)

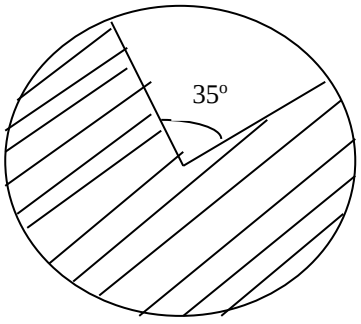
4. Factorize the quadratic expression below: x^2+6x+9 (3mks)

5. The interior angle of a regular polygon is 150^o. Find the value of n. (3 mks)

6. Simplify the following expression (3 mks)

$$\frac{ax-ay+bx-by}{a+b}$$

7. Calculate the area of the shaded region given that the radius is 27cm. (4 mks)



8. Simplify: $\frac{\frac{1}{2}of\frac{5}{7}+(\frac{3}{5}+2/5}{3\frac{1}{3}-\quad 1\frac{4}{9}}$ (3 mks)

9. Using a pair of compasses and a ruler only construct a triangle ABC such that AB= 4cm, BC = 6cm and angle ABC = 135°. (3mks)

WEEK 5

10. Calculate the volume of a sphere of radius 9cm. (3mks)

11. Solve for **x**. If $3^{2X+3}+1 = 28$. (3mks)

12. A straight line passing through A (-2,1) and B(2,-k). The line is perpendicular to a line 3y + 2x = 5. Determine the value of **k** and hence the equation passing through A and B. (3mks)

13. Use substitution method to solve

3y+2x=13

2y-3x=0 (3mks)

WEEK 6

SECTION II (30 MARKS)

ANSWER**ALL***QUATIONS IN THIS SECTION*

14. A soda depot had 30816 sodas which were packed in crates. Each crate contained 24 sodas. The mass of an empty crate was 2kg and that of a full crate is 12 kg.
a) How many crates were there?
(2mks)

b) What was the total mass of empty crates?
(2mks)

c) What was the total mass of sodas alone?
(3mks)

d) A lorry was hired to transport the crates at a cost of sh. 5 per crate of soda per trip. The lorry could only carry 107 crates per trip. How much money was spent on transporting all the crates?
(3mks)

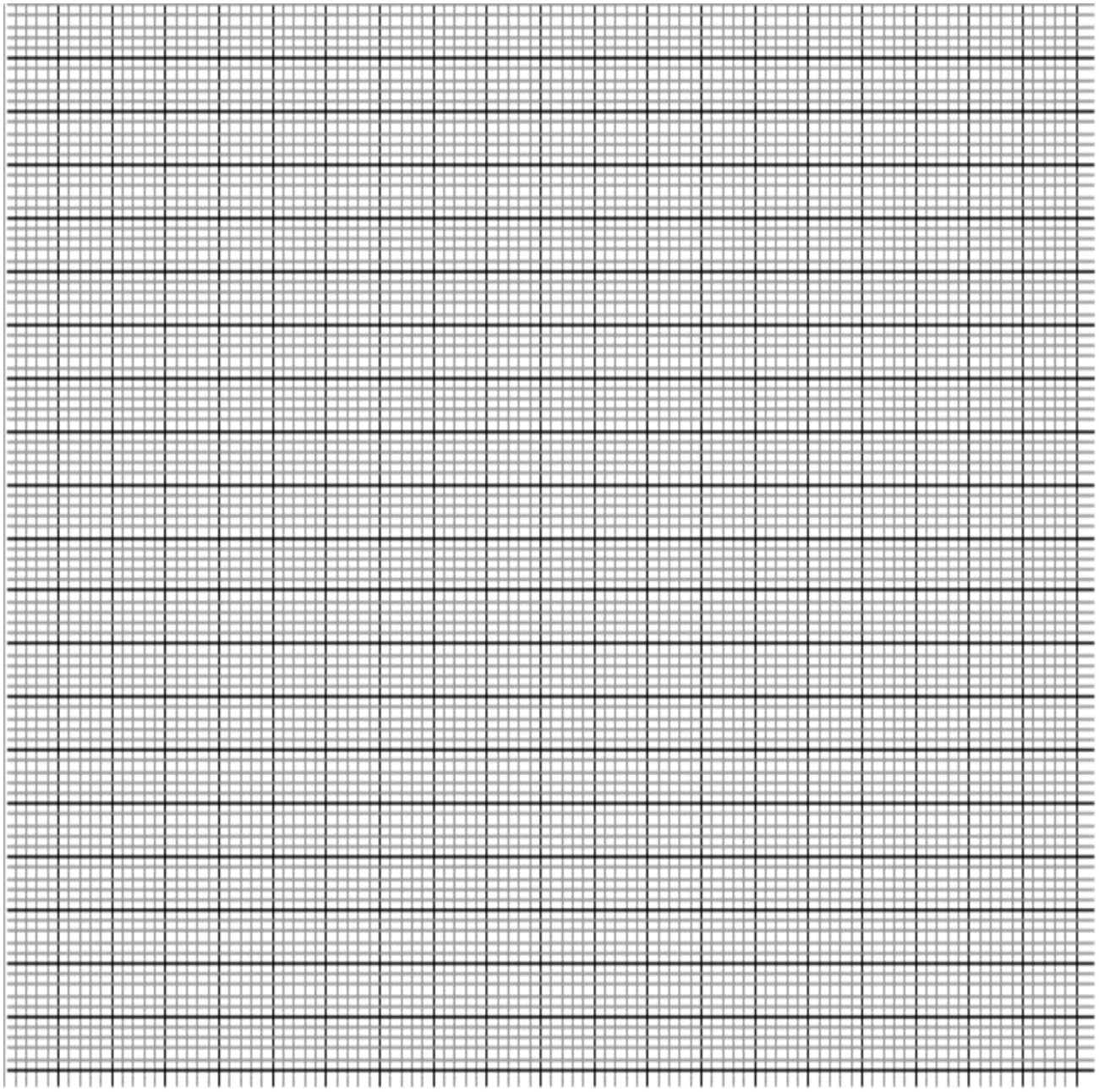
15. Triangle PQR has vertices P(3,2), Q(-1,1) and R(-3,-1).

(a) Draw PQR on the grid provided.
(1mk)

(b) Under a rotation the vertices of $P^1Q^1R^1$ are $P^1(1,4)$, $Q^1(2,0)$ and $R^1(4,-1)$. Find the centre and angle of rotation using points P and Q.
(4mks)

(c) Triangle PQR is enlarged with scale factor 3 centre O(0,0) to give triangle $P^2Q^2R^2$. Draw triangle $P^2Q^2R^2$ and state its co-ordinates.
(2mks)

(d) Triangle $P^1Q^1R^1$ undergoes reflection in line y = x to give triangle $P^3Q^3R^3$. Draw $P^3Q^3R^3$ and state its coordinates.
(3mks)



16. A country bus left Nairobi at 10.45a.m and traveled towards Mombasa at an average speed of 60km/h. A matatu left Nairobi at 1:15p.m on the same day and traveled along the same road at an average speed of 100km/h. The distance between Nairobi and Mombasa is 500km.

(a) Determine the time of the day when the matatu overtook the bus (5mks)

(b) Both vehicles continued towards Mombasa at their original speeds. How long had the Matatu waited before the bus arrived? (5mks)

WEEK 7

SECTION 1 (50 marks)

1. Evaluate: $\frac{-8 \times -8 + 6}{-3 + (-8) \div 2 \times 4}$

(3 marks)

2. A number k is formed by writing all the prime numbers between 0 and 10 in ascending order. Another whole number p is formed by writing all the square numbers between 0 and 10 in ascending order. Find k-p. (3 marks)

3. Evaluate using squares and square root tables: $(0.072)^2 + \sqrt{4451}$

(3 marks)

4. A tourist arrived in Kenya with US Dollars 3000 which he exchanged into Kenya shillings. He spent Ksh.100, 000 on hotel accommodation and Ksh.80, 000 on travel and other expenses. He changed the remaining money into sterling pounds. Calculate how much money in sterling pounds that he remained with using the following rates. (Leave your answer to the nearest 1£)

	Buying(Kshs)	Selling(Kshs)
1 US dollar($)	100.00	101.00
1 Sterling pound(£)	120.27	120.00

(3 marks)

5. Evaluate: $\dfrac{\frac{5}{6}of\left(4\frac{1}{3}-3\frac{5}{6}\right)}{\frac{5}{12}\times\frac{3}{25}+1\frac{5}{9}\div2\frac{1}{3}}$

(3 marks**)**

6. A camera which is marked at Ksh 2400 is sold to a consumer after allowing him a 10% discount. By so doing the trader still makes a profit of 20% on the cost of the camera. Determine the cost price of the camera.

(3 marks)

7. Convert $2.\dot{4}\dot{5}$ into a fraction in its simplest form.

(3 marks)

8. Show that 8260439 is exactly divisible by 11, using test of divisibility. (3 marks)

9. 2000 cm^3 of milk of density 0.9g/cm^3 were added to 1200 cm^3 of water of density 1g/cm^3. Calculate the density of the mixture. (4 marks)

10. Solve the equation. $\frac{y+3}{3} + \frac{y}{2} = \frac{10y}{3}$ leaving answer as a fraction (3 marks)

11.18 men take 15 days to dig 6 hectares of land. Find how many men are required to dig 8 hectares in 12 days. (3 marks)

12. Write in figures and give the place value and total value of the third digit in the number; three million, seventy nine thousand, seven hundred and fifty nine

(3marks)

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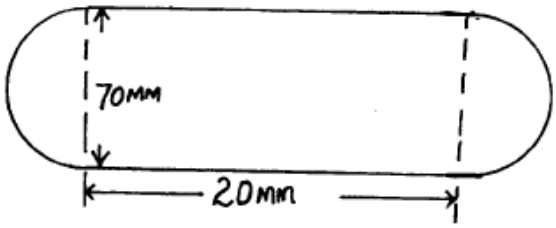
13. Solve the simultaneous equations below

(3 marks)

$$3x - 2y = 7$$
$$5x + y = 3$$

14. The figure below (not drawn to scale) shows the cross-section of a metal bar of length 3 metres. They are equal semi circles.



Determine the mass of the metal bar in kilograms if the density of the metal is $8.87g/cm^3$.

(4 marks)

15. Peter started his trip on Monday at 8.30 a.m. If the trip took him a total of 7 hours and 13 minutes, at what time did he complete the trip? Give your answer in 24 hour clock system

(3 marks)

16. Four light signals are programmed at intervals of 40 seconds, 50 seconds, 60seconds and 75 seconds. What is the earliest time they will give out light signals simultaneously if the last time they did this was at 8.15a.m? (3 marks).

WEEK 8

SECTION 2 (50 marks)

17. A train left Mombasa on Monday evening and travelled to Kisumu according to the travel time table below. The train arrived in Kisumu on Wednesday morning of the same week.

Mombasa	dep.	1930 h
Mtito Andei	arr.	0250 h
	dep.	0335 h
Nairobi	arr.	1050 h
	dep.	1240 h
Nakuru	arr.	1900 h
	dep.	2015 h
Kisumu	arr.	0900 h

(a) Determine the time the train took to travel between (4 marks)

(i) Mombasa and MtitoAndei

(ii) MtitoAndei and Nairobi

(iii) Nairobi and Nakuru

(iv) Nakuru and Kisumu

(b) Calculate the total time for the whole journey. (4 marks)

(c) Given that the railway road distance between Mombasa and Kisumu is 1 200 km, calculate the average speed of the train (2 marks)

18. Copy and complete the tables (i) and (ii) below for the functions y = 7 – 3x and y = 2x – 8 respectively

(a) (i) $y = 7 - 3x$ (2 marks)

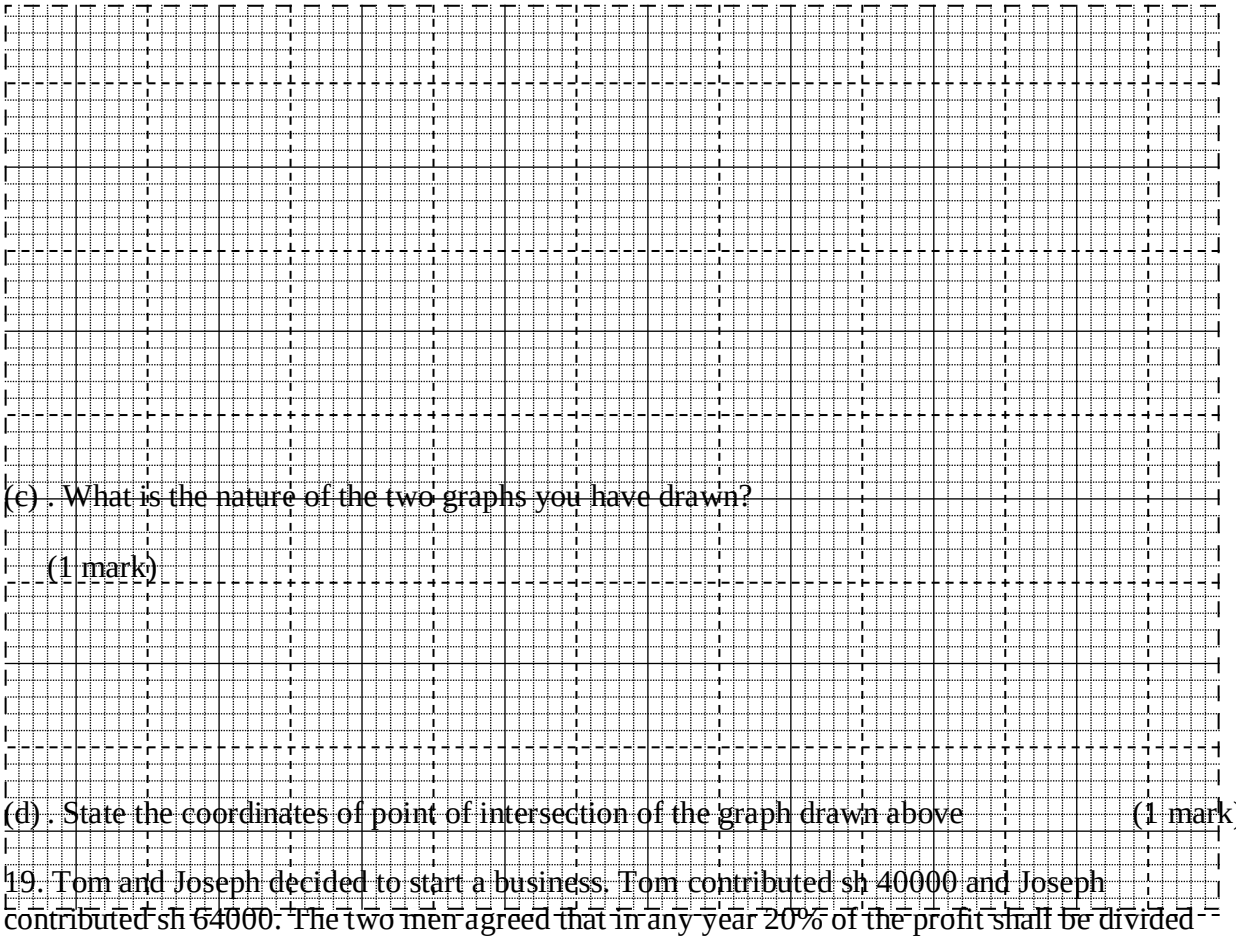
x	-2	-1	0	1	2	3	4	5
y	13		7					-8

(ii) $y = 2x - 8$

(2 marks)

x	-4	-2	0	2	4	6	8	10
y	-16		-8			4		

(b) On squared paper and on the same grid draw the graph of $y = 7 – 3x$ and $y = 2x – 8$ (4marks)



(c) . What is the nature of the two graphs you have drawn?

(1 mark)

(d) . State the coordinates of point of intersection of the graph drawn above (1 mark)

19. Tom and Joseph decided to start a business. Tom contributed sh 40000 and Joseph contributed sh 64000. The two men agreed that in any year 20% of the profit shall be divided equally between them and 30% of the remaining profit will be used to meet the cost for running the business the following year. They also agreed to share the rest of the profit in the ratio of their contributions. The profit made after first year was sh 86400.

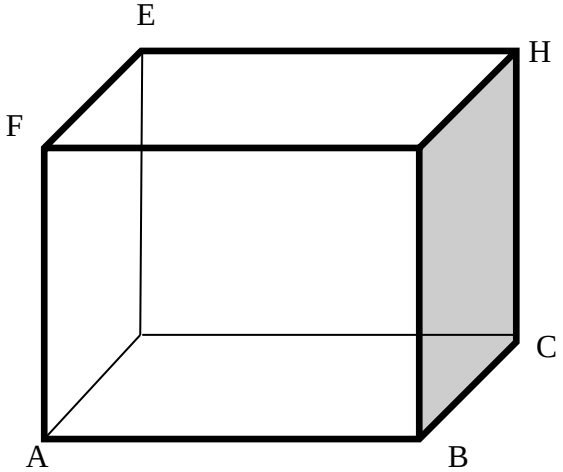
a) How much money did they set aside towards the cost of running the business for the second year? (2 marks)

b) How much did Joseph receive at the end of the first year? (4 marks)

c) Tom bought goats with his share of the profit. If each goat costs sh 1850, how many goats did he buy? (4 marks)

20 (a). The volume of a closed cylinder of radius 7cm is 1540cm^3. Take $\pi = \frac{22}{7}$ .calculate its height and total surface area. (5 marks).

b). The figure below represents a closed cuboid ABCDEFGH with a rectangular base.AB = 12cm, BC = 5cm and CH = 15cm.Calculate the surface area of the cuboid. (5 marks)



21. Simplify the following expression

i. $\frac{2m-am-2y+ay}{2m+2y-am-ay}$ (3 marks)

ii. $\frac{pr+r^2}{p} - \frac{pr+r^2}{r}$ (3 marks)

iii. $\frac{am-ay+bx-by}{a+b}$ (2 marks)

iv. If a = 2, b = 3 and c = -5. Evaluate : 2ab – c (2 marks)