Name: ……………………………………………………ADM: …………Class: …………

School: ……MARKING SCHEME……………………

Mathematics Paper 2

TIME: 2 ½ Hours

FEBRUARY 2022

BUNAMFAN FORM 4 EXAM2022

INSTRUCTIONS TO CANDIDATES

1. Write your name, Admissionnumber, class and school.
2. The paper contains two sections: Section I and II
3. Answer ALL questions in section I and ANY FIVE questions from section II.
4. All working and answers must be written on the question paper in the spaces provided below each question.
5. Marks may be awarded for correct working even if the answer is wrong.
6. Negligent and slovenly work will be penalized.
7. Non-programmable silent electronic calculators and mathematical tables are allowed for use.

FOR EXAMINERS USE ONLY

SECTION 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL

SECTION II

17	18	19	20	21	22	23	24	TOTAL

GRAND TOTAL

This paper consists 14 of printed pages.

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION 1 (50marks)

(Answer all questions in this section)

1. The length and width of a rectangle were measured as 12.4cm and 5.0cm respectively. Find to 4 significant figures, the percentage error in calculating the area of the rectangle (3mks)

W.A = 12.4 × 5.0 = 62

max A = 12.45 × 5.05 = 62.8725

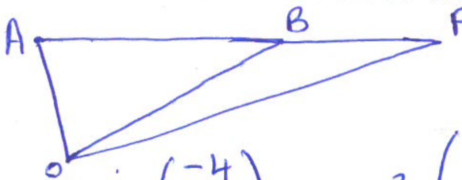
min A = 12.35 × 4.95 = 61.1325 } B1

$A.E = \frac{62.8725 - 61.1325}{2} = 0.87$

$\frac{0.87}{62} \times 100$ ✓ M1

= 1.403% ✓ A1

2. The co-ordinates of a point A is (2, 8, 3) and B is (-4, -8, -5). A point P divides AB externally in the ratio 7 : 3. Determine the co-ordinates of P (3mks)



$\frac{7}{4}\begin{pmatrix}-4\\-8\\-5\end{pmatrix} + \frac{-3}{4}\begin{pmatrix}8\\8\\3\end{pmatrix}$ ✓ M1

$\begin{pmatrix}-7\\-14\\-35/4\end{pmatrix} + \begin{pmatrix}-6\\-6\\-9/4\end{pmatrix}$ ✓ M1 $= \begin{pmatrix}-13\\-20\\-11\end{pmatrix}$

P = (−13, −20, −11)

3. Solve for x:

Solve for x: $(\log_3 x)^2 - \frac{1}{2}\log_3 x = {}^3/_2$ (3mks)

Let $\log_3 x$ be a.

$a^2 - \frac{1}{2}a = \frac{3}{2}$

$2a^2 - a - 3 = 0$

$(a+1)(2a-3) = 0$ ✓ M1

$a = -1$, $a = \frac{3}{2}$ ✓ A1 for both

$\log_3 x = -1$

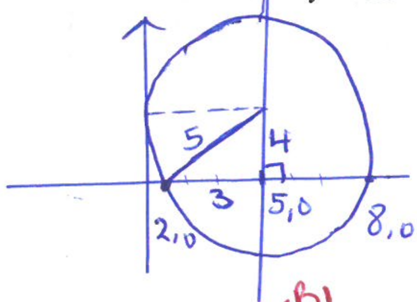
$x = 3^{-1} = \frac{1}{3}$

$\log_3 x = 1.5$

$x = 3^{1.5} = 5.196$

$x = \frac{1}{3}$ & 5.196 ✓ B1 for both.

4. A circle is tangent to the y – axis and intersects the x- axis at (2,0) and (8,0). Obtain the equation of the circle in the form $x^2 + y^2 + ax + by + c = 0$, where a, b and c are integers (4mks)



Center (5, 4) ✓ B1 r = 5 ✓ B1

$(x-5)^2 + (y-4)^2 = 5^2$ M1

$x^2 - 10x + 25 + y^2 - 8x + 16 = 25$

$x^2 + y^2 - 10x - 8x + 16 = 0$ ✓ A1

5. Solve for X in the equation:

$2\ Sin^2x - 1 = Cos^2x + Sin\ x$, for $0^0 \leq x \leq 360^0$ (3mks)

$\cos^2 x = 1 - \sin^2 x$

$2\sin^2 x - 1 = 1 - \sin^2 x + \sin x$

$3\sin^2 x - \sin x - 2 = 0$ ✓M1

$3a^2 - a - 2 = 0$

$(3a+2)(a-1) = 0$

$a = -\frac{2}{3}$ and $a = 1$ ✓A1

$\sin x = -\frac{2}{3}$ $\sin x = 1$

$\sin^{-1}\frac{2}{3} = 41.81^0$ $x = 90^0$

$x = 221.81,\ 318.19$

$x = 90^0,\ 221.81^0,\ 318.19^0$ – B1

6. Make P the subject of the formula (3mks)

$$T = \sqrt[3]{\frac{P^2+n}{m^2}} + R$$

$[T-R]^3 = \sqrt[3]{\frac{p^2+n}{m^2}}^{\,3}$

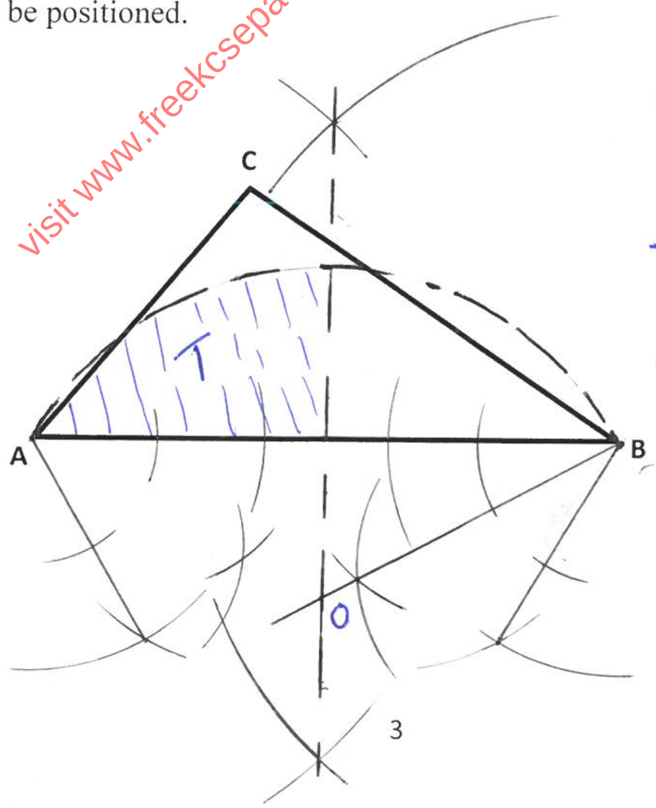
$\frac{p^2+n}{m^2} = [T-R]^3$ ✓M1

$p^2 + n = m^2[T-R]^3$

$p^2 = m^2[T-R]^3 - n$ ✓M1

$p = \sqrt{m^2[T-R]^3 - n}$ ✓A1

7. The figure below represents a flower garden ABC. A tap T is to be placed inside the triangle such that it is nearer A than B and angle ATB is greater than 120^0. By construction, show the region T where the tap can be positioned. (4mks)



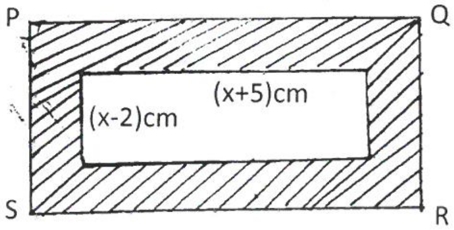
→ brocken bisector of AB ✓B1

→ Center O located ✓ B1

→ Arc AB (dotted) ✓ B1

→ Region T identified B1

8. PQRS is a rectangle whose area 170cm^2. The internal rectangle measures (x+5)cm by (x-2)cm.



Determine the area of the shaded part if the thickness of this part is 0.1x cm (4mks)

$$1 \quad (1{\cdot}2x+5)(1{\cdot}2x-2) = 170 \checkmark M1$$

$$1{\cdot}44x^2 + 3{\cdot}6x - 180 = 0$$

$$2x^2 + 5x - 250 = 0$$

$$x = \frac{-5 \pm \sqrt{25+2000}}{4} \checkmark M1$$

$$x = -12{\cdot}5, \quad x = 10$$

$$\therefore x = 10 \checkmark A1$$

$$(10+5)(10-2) = 120$$

Shaded Area

$$= 170 - 120$$

$$= 50 \text{ cm}^2 \checkmark B1$$

9. Find the length of an arc of a circle which subtends an angle of 0·8 radians at the center of the circle. The radius of the circle is 15 cm. (2mks)

$$\frac{l}{15} = 0{\cdot}8 \checkmark M1$$

$$l = 12 \text{ cm} \checkmark A1$$

10. A map has a scale of 1: 25 000. On this map a square piece of land is represented by an area of 2cm^2. Calculate the actual area in hectares of the land. (2mks)

$$A.S.F = 1 : 25\,000^2.$$

$$\text{Actual Area} = \frac{25\,000^2 \times 2}{10{,}000}$$

$$= 125\,000 \text{ m}^2 \checkmark B1$$

$$\frac{125{,}000}{10{,}000}$$

$$12{\cdot}5 \text{ Ha} \checkmark B1$$

11. A dealer has two types of grades of tea, A and B. Grade A costs shs.140 per kg while grade B costs shs.160 per kg. determine the ratio he should mix A and B so that he makes a 60% profit when he sells the mixture at shs.232 per kg. (3mks)

$$\text{COST} = \frac{232}{160} \times 100 = 145$$

$$\frac{140A + 160B}{A+B} = 145 \quad \checkmark M1$$

$$140A + 160B = 145A + 145B$$

$$15B = 5A \quad \checkmark M1$$

$$\frac{A}{B} = \frac{3}{1}$$

A : B

3 : 1 ✓ A1

ACCEPT

A : B

140 160

145

15 : 5 ✓B1 ✓B1

3 : 1 ✓B1

12. The data below shows marks scored by 8 form four students in Molo district mathematics contest 44, 32, 67, 52, 28, 39, 46, 64. Calculate the mean absolute deviation of the data. (3mks)

$$\bar{x} = \frac{44 + 32 + \cdots + 64}{8} = 46.5 \quad \checkmark M1$$

$$d = -2.5,\ -14.5,\ 20.5,\ 5.5,\ -18.5,\ -7.5,\ -0.5,\ 17.5$$

$$\frac{\Sigma|d|}{N} = \frac{2.5 + 14.5 + \cdots + 17.5}{8} \quad \checkmark M1$$

$$= 10.875 \quad \checkmark A1$$

13. A variable y varies as the square of x and inversely as the square root of z. Find the percentage change in y when x is changed in the ratio 5:4 and z reduced by 19% (3mks)

$$y \propto \frac{x^2}{\sqrt{z}}$$

$$y = \frac{kx^2}{\sqrt{z}}$$

$$x' = \frac{5}{4}x = 1.25x$$

$$z' = 0.81z$$

$$y' = \frac{k \cdot (1.25x)^2}{\sqrt{0.81z}} \quad \checkmark M1$$

$$= \frac{1.5625}{0.9} \cdot \frac{kx^2}{\sqrt{z}}$$

$$y' = 1.736111$$

$$\% = [1.736111 - 1] \times 100$$

$$= 73.61\%$$

Z increases by 73.61% ✓A1

14. Simplify $\frac{2\sqrt{2}}{1+\sqrt{2}} - \frac{\sqrt{2}}{1-\sqrt{2}} = a + b\sqrt{c}$ leaving your answer in the form $a + b\sqrt{c}$, where a, b and c are rational numbers. (3mks)

$$\frac{2\sqrt{2}}{1+\sqrt{2}} - \frac{\sqrt{2}}{1-\sqrt{2}} = \frac{2\sqrt{2}[1-\sqrt{2}] - \sqrt{2}[1+\sqrt{2}]}{1^2 - [\sqrt{2}]^2} \checkmark M1$$

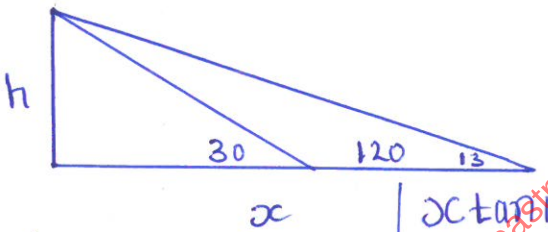
$$\frac{2\sqrt{2} - 4 - \sqrt{2} - 2}{1 - 2.} \checkmark M1$$

denominator rational

$$\frac{-6 + \sqrt{2}}{-1}$$

$$6 - \sqrt{2} \checkmark A1$$

15. When a man is standing at a point x, he observes that the angle of elevation of the top of a flag post is 13°, he walks 120 m towards the flag post and the angle of elevation is 30°. If the eyes of the man are 1.5m from the ground, find the height of the flag post. (4mks)



$\tan 13 = \frac{h}{x}$

$\tan 30 = \frac{h}{x-120}$

$x \tan 13 = \tan 30 (x-120)$ ✓ M1

$x = \frac{120 \tan 30}{\tan 30 - \tan 13}$

$= 199.96\text{m}$ ✓ A1

accept 199.97

$h = 199.96 \tan 13$ ✓ M1

$h = 46.16\text{m}$

$\text{height} = 46.16 + 1.5$

47.66m ✓ A1

16. The find the value of x given that matrix T below has no inverse. (3mks)

$$T = \begin{bmatrix} x+1 & 2 \\ 4x & 2x \end{bmatrix}$$

$2x[x+1] - 8x = 0$ ✓ M1

$2x^2 + 2x - 8x = 0$

$2x^2 - 6x = 0$

$x^2 - 3x = 0$

$x(x-3] = 0$ ✓ M1

$\therefore x = 0 \quad \text{OR} \quad x = 3$ ✓ A1

SECTION II 50 marks

(Answer only five questions in this Section)

17. A tank has two water taps P and Q and another tap R. When empty the tank be filled by tap P alone in 5 hours or by tap Q in 3 hours. When full the tank can be emptied in 8 hours by tap R

a) The tank is initially empty. Find how long it would take to fill up the tank

i) If tap R is closed and taps P and Q are opened at the same time. (2mks)

$\frac{1}{5} + \frac{1}{3} = \frac{8}{15}$ M1

Time $= \frac{15}{8} = 1\frac{7}{8}$ hours A1

Accept 1.875

ii) If all the three taps are opened at the same time. Giving your answer to the nearest minute. (2mks)

$\frac{8}{15} - \frac{1}{8} = \frac{49}{120}$ M1

$2\frac{22}{49}$ hrs

2 hours 27 mins A1

or 147 mins

b) Assume the tank initially empty and the three taps are opened as follows;

P at 8:00 am, Q at 9:00 am and R at 9:00 am

i) Find the fraction of the tank that would be filled by 10:00 am. (3mks)

$\left[\frac{1}{5} \times 2\right] + \left[\frac{1}{3} \times 1\right] + \left[\frac{1}{8} \times 1\right] =$ M1

$\frac{2}{5} + \frac{1}{3} + \frac{1}{8}$ M1

$= \frac{73}{120}$ A1

ii) Find the time the tank would be fully filled up. Give your answer to the nearest minute. (3mks)

Remaining $= 1 - \frac{73}{120} = \frac{47}{120}$ M1

1 hour $= \frac{49}{120}$

$x = \frac{47}{120}$

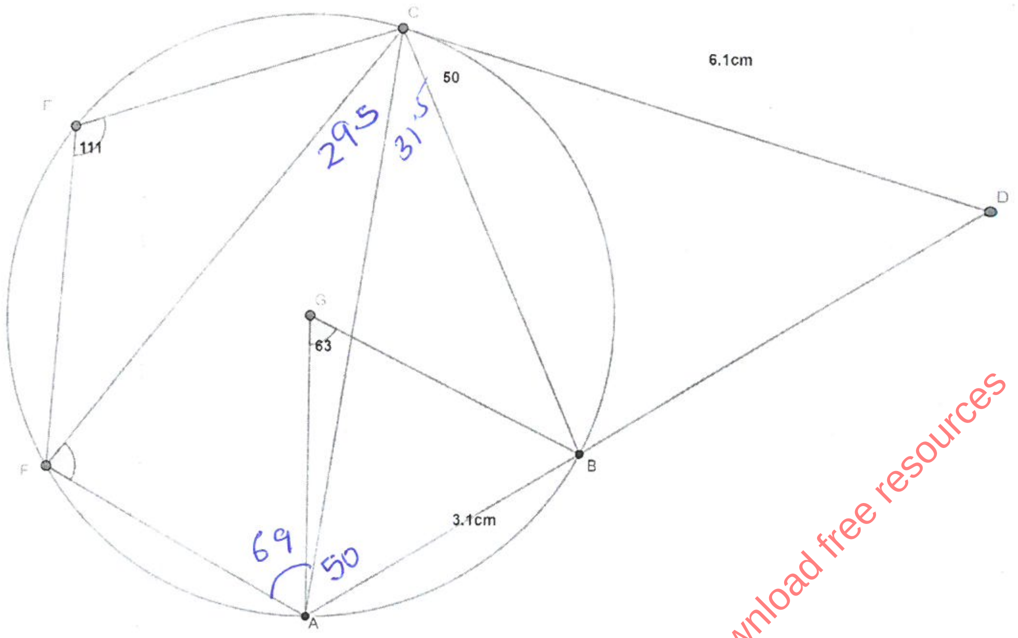
$x = \frac{47}{120} \times \frac{120}{49}$ A1

$\Rightarrow$ 57.55 mins

$\simeq$ 58 mins

10.58 am B1

18. In the figure below, G is the center of the circle. <DCB = 50°, <AGB = 63° and <FEC = 111°



(a)Determine the size of the following angles

i. FAC (1mk)

$180 - 111$

$= \underline{\underline{69^\circ}}$ ✓ B1

ii. BAC (1mk)

$\angle DCB = \angle BAC$

$= \underline{\underline{50^\circ}}$ ✓ B1

iii. ACB (1mk)

$\angle ACB = \frac{1}{2} \angle AGB$

$= \frac{1}{2} \times 63 = \underline{\underline{31.5^\circ}}$ ✓ B1

iv. ACF (1mk)

$ACB = 180 - (69 + 50) = 61$

$ACF = 61 - 31.5$

$= \underline{\underline{29.5^\circ}}$ ✓ B1

v. AFC (1mk)

$180 - (69 + 29.5) = \underline{\underline{81.5^\circ}}$ ✓ B1 (b)DC is a tangent to the circle at C and its length is 6cm. AD is a straight line and chord AB is **3.1**cm. Determine

(i) The length of BD (2mks)

$x(3.1+x) = 6.1^2$ ✓ M1

$x^2 + 3.1x = 37.21$

$x^2 + 3.1x - 37.21 = 0$

$\frac{-3.1 \pm \sqrt{9.61 + 148.84}}{2}$

$\frac{-3.1 \pm 12.59}{2}$

$x = -7.845$ ~~&~~ $x = 4.745$

$\therefore BD = 4.745$ ✓ A1

(ii) Area of triangle ABC (3mks)

$\frac{3.1}{\sin 31.5} = \frac{BC}{\sin 50}$ ✓ M1

$BC = \frac{3.1 \sin 50}{\sin 31.5}$

$= 4.545$ ✓ A1

$A \quad \frac{1}{2} \times 4.545 \times 3.1 \sin 98.5$

$= 6.967$ ✓ B1

19. The table below shows the income tax rates in a certain year.

Annual taxable income in Kenya shillings	Tax rate in %
0-144000	0%
144 001 -300 000	10
300 001 – 468 000	15
468 001 -648 000	20
648 001-840 000	25
Above 840 000	30

During that year Kurenta's annual gross tax in sixth band was Shs 108 000.

(a) Determine Kurenta's annual gross tax. (3mks)

1st band = 0

2nd $\frac{10}{100} \times 156,000 = 15,600$

3rd $\frac{15}{100} \times 168,000 = 25,200$ M1

4th $\frac{20}{100} \times 180,000 = 36,000$

5th $\frac{25}{100} \times 192,000 = 48,000$ M1

6th = 108 000

15 600 + 25,200 + 36000 + 48000 + 108 000

= 232,800 A1

(b) If he enjoyed annual relief of Shs. 21 000, determine his monthly net tax (P.A.Y.E)(2mks)

$= \frac{232\ 800 - 21\ 000}{12}$ M1

= 17, 650 A1

(c) Kurenta had a basic salary of Shs X Shs p.a. and enjoyed **non-taxable** allowances that is equivalent to 45% of basic salary. Determine Kurenta's gross salary p.m. (3mks)

6th band = $\frac{30}{100} \times x = 108,000$ B1

$x = 360,000$.

Taxable Income = 360,000 + 840 000

= 1, 200, 000 B1

$\frac{145}{100} \times 1,200,000$

$\frac{1,740,000}{12}$

145,000/= B1

(d)The following deductions were also made from Kurenta's salary every month: Co-operative shares 8 000, Co-operative loans 12 000, Pension scheme 4 000, Union dues 2000. (2mks)

Determine Kurenta's monthly net salary during that year.

~~Total~~ Net Salary 145000 – [17650 + 8000 + 12000 + 4000 + 2000] M1

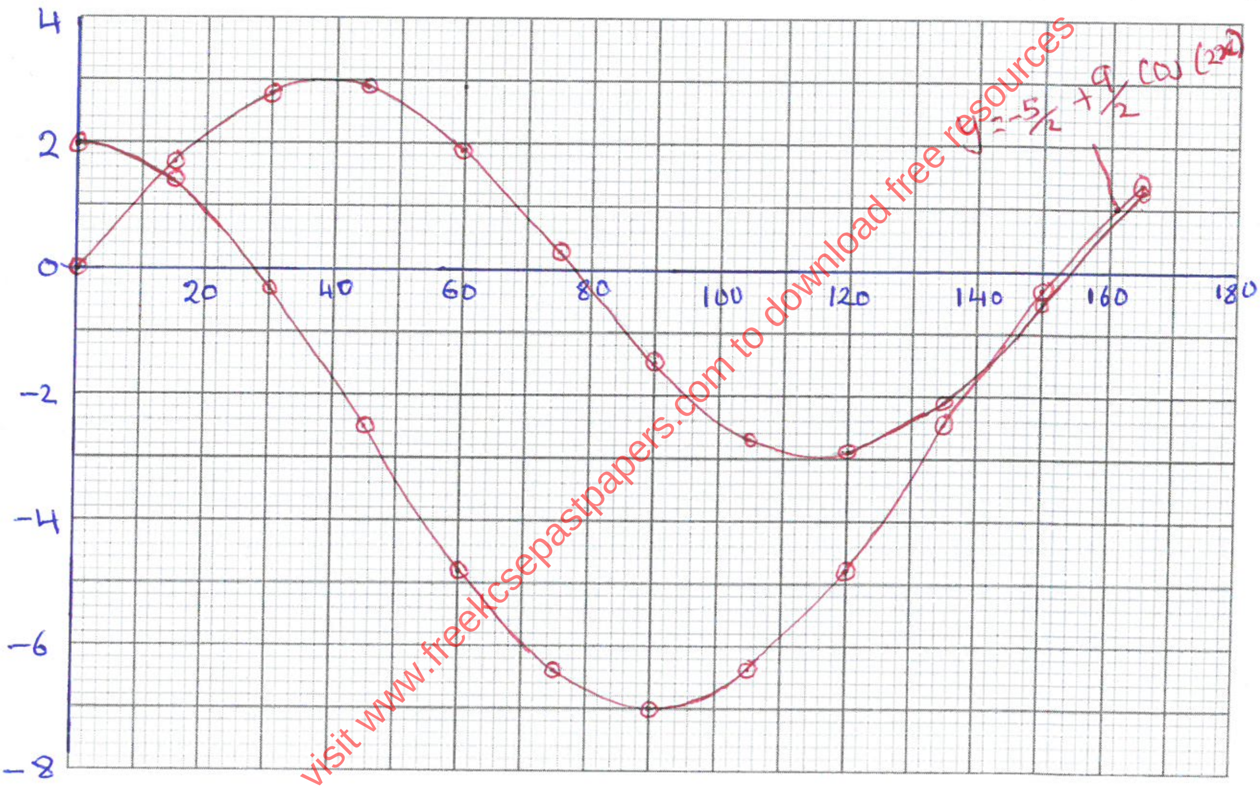
= 101 ,350/= A1

20. (a)Complete the table below for the functions $y = -\frac{5}{2} + \frac{9}{2}cos(2x)$ and $y = 3sin\left(\frac{7x}{3}\right)$ to 1 d.p for $0^0 \leq x \geq 165^0$ (2mks)

x	0	15	30	45	60	75	90	105	120	135	150	165
$y = -\frac{5}{2} + \frac{9}{2}cos(2x)$	2	1.4	-0.3	-2.5	-4.8	-6.4	-7	-6.4	-4.8	-2.5	-0.3	1.4
$y = 3sin\left(\frac{7x}{3}\right)$	0	1.7	2.8	2.9	1.9	0.3	-1.5	-2.7	-2.9	-2.1	-0.5	1.3

(b)Draw the graphs of $y = -\frac{5}{2} + \frac{9}{2}cos(2x)$and $y = 3sin\left(\frac{7x}{3}\right)$ on the same grid.

(*use a scale of 1cm to rep 10⁰ on the x-axis and 1cm to rep 1unit on the y-axis*.) (5mks)



(c)Use your graph to solve $9cos(2x) - 6sin\left(\frac{7x}{3}\right) = 5$ (3mks)

$9\cos 2x - 6\sin\frac{7x}{3} = 5$

$-5 + 9\cos 2x = 6\sin\frac{7x}{3}$

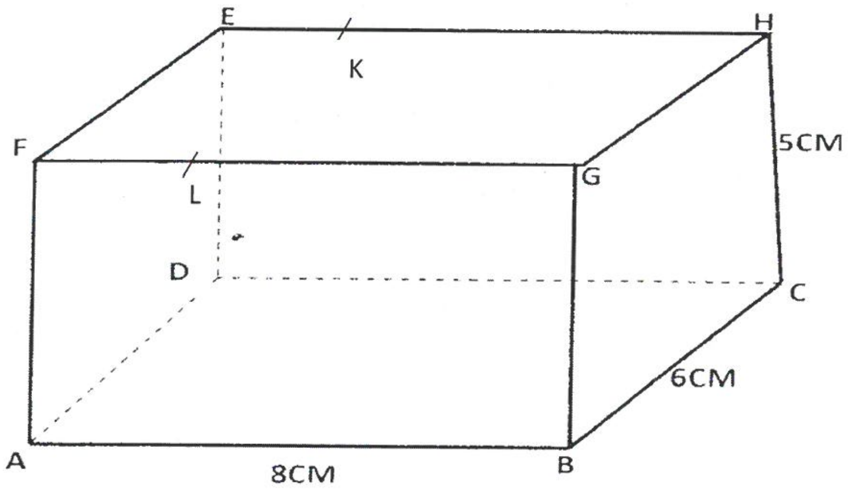
$-\frac{5}{2} + \frac{9}{2}\cos 2x = \frac{6}{2}\sin\frac{7x}{3}$ ✓ M1

$-\frac{5}{2} + \frac{9}{2}\cos 2x = 3\sin\frac{7x}{3}$

$x = 13^0$ ✓B1, $x = 142^0$ ✓B1

~~21. The figure below shows a cuboid ABCDEFGH with AB = 8cm, BC = 6cm and CH = 5cm.~~

21. The figure below shows a cuboid ABCDEFGH with AB = 8cm, BC = 6cm and CH = 5cm.



Calculate to 1 d.p

(a) The length BE (2mks)

$BD = \sqrt{8^2 + 6^2}$ ✓

$= 10\text{ cm}$ ✓ B1

$BE = \sqrt{10^2 + 5^2} = 11.18$

$= 11.2$ ✓ B1

(b) The angle between BE and plane ABCD (1mk)

$\tan\theta = 5/10$

$\theta = 26.57^\circ$

$\theta = 26.6^\circ$ ✓ B1

(c) The angle between lines FH and BC. (2mks)

Translate BC to GH

$\tan\theta = 8/6 = 4/3$ M1

$\theta = 53.13^\circ$

$\theta = 53.1^\circ$ ✓ A1

(d) The acute angle between lines FH and BD (1mks)

$\sin \frac{1}{2}\theta = 3/5$

$\frac{1}{2}\theta = \sin^{-1} 3/5 = 36.87.$

$\theta = 36.87 \times 2$

$= 73.74^0$

$\theta = 73.7^0$ ✓ B1

(e) The angle between place AGHD and planes ABCD (2mks)

$\tan \theta = 5/8$ ✓ M1

$\theta = \tan^{-1} 5/8$

$\theta = 32.01^0$

$\theta = 32.0^0$ ✓ A1

(f) Point K and L divides EH and FG respectively in the ratio 1: 3. Determine the angle between planes ADKL and BCKL (2mks)

$\left.\begin{array}{l}\tan \theta_1 = 2/5 \\ \tan \theta_2 = 6/5\end{array}\right\}$ Any one M1

$21.80 + 50.19$

71.99^0

72.0^0 ✓ A1

22. Juice type Q is 60% tangerine and the rest is water. Juice type P is 30% water and the rest is pineapple.

(a) Jane mixes 8 litres of Q with 12 litres of P to produce a blend juice B. Find the percentage of water in blend B (2mks)

Total mixture = 12 + 8 = 20 M1

water $= \left[\frac{40}{100} \times 8 + \frac{30}{100} \times 12\right] = 6.8$

$\frac{6.8}{20} \times 100$

$= 34\%$ A1

(b) Janet makes 8L of a blend juice R that is 36% water by mixing juice Q and P. Determine the amount of juice Q and P that she uses. (4mks)

$\frac{40\% Q + 30\% P}{Q + P} = 36\%$ M1

$40Q + 30P = 36Q + 36P$

$4Q = 6P$

$\frac{Q}{P} = \frac{3}{2}$

$Q : P = 3 : 2$ A1

$Q = \frac{3}{5} \times 8 = 4.8L$ B1

$P = \frac{2}{5} \times 8 = 3.2L$ B1

(c) 5L of B is now mixed with 3L of Q to produce blend W. Find the concentration of tangerine in blend W. (4mks)

5L 3L

B Q

Tangerine in $Q = \frac{60}{100} \times 3 = 1.8L$ B1

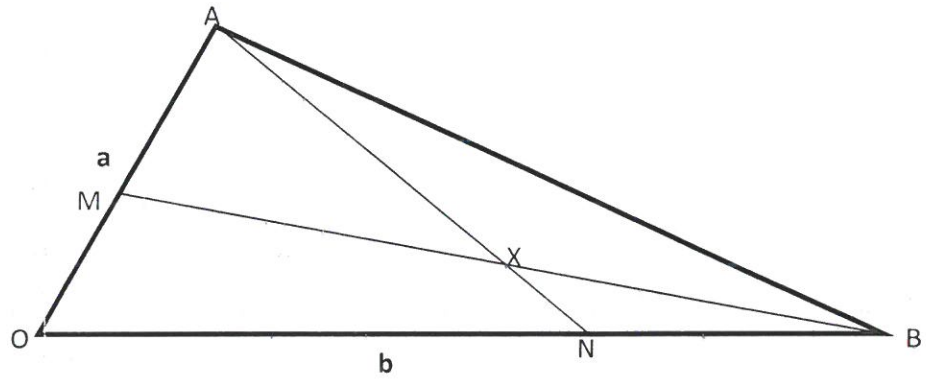
% of Tangerine in $B = \frac{0.6 \times 8}{20} \times 100 = 24\%$

Tangerine in 5L of $B = \frac{24}{100} \times 5 = 1.2L$ B1

$\frac{1.8 + 1.2}{8} \times 100$ M1

37.5% A1

23. In triangle OAB below **OA = a**, **OB = b** point M lies on **ON** such that **OM : MA**= 2:3 and point N lies on **OB** such that **ON: NB** = 5:1 line AN intersect line MB at X.



(a) Express in terms of **a** and **b**

(i) AN $= \vec{AO} + \vec{ON}$ (1mk)

$= -\underset{\sim}{a} + \frac{5}{6}\underset{\sim}{b}$

(ii) BM $= \vec{BO} + \vec{OM}$ (1mk)

$= -\underset{\sim}{b} + \frac{2}{5}\underset{\sim}{a}$

b) Given that AX=kAN and BX=rBM where k and r are scalars.

i. write down two different expression for OX in terms of **a**,**b**,kand r. (2mks)

$\vec{OX} = \vec{OA} + \vec{AX}$

$= \underset{\sim}{a} + k(-\underset{\sim}{a} + \frac{5}{6}\underset{\sim}{b})$ ✓B1

$= (1-k)\underset{\sim}{a} + \frac{5}{6}k\underset{\sim}{b}$

$\vec{OX} = \vec{OB} + \vec{BX}$

$= \underset{\sim}{b} + r(-\underset{\sim}{b} + \frac{2}{5}\underset{\sim}{a})$ ✓B1

$= (1-r)\underset{\sim}{b} + \frac{2}{5}r\underset{\sim}{a}$

ii. Find the value of k and r. (4mks)

$(1-k)\underset{\sim}{a} + \frac{5}{6}k\underset{\sim}{b} = (1-r)\underset{\sim}{b} + \frac{2}{5}r\underset{\sim}{a}$ ✓M1

$\left.\begin{array}{l} 1-k = \frac{2}{5}r \\ \frac{5}{6}k = 1-r \end{array}\right\}$ M1

$k = 1 - \frac{2}{5}r$

$\frac{5}{6}(1 - \frac{2}{5}r) = 1-r$ ✓M1

$r = \frac{1}{4}$

$k = 1 - \frac{2}{5} \times \frac{1}{4}$

$k = \frac{9}{10}$

$r = \frac{1}{4}$ & $k = \frac{9}{10}$ ✓B1

iii. Determine the ratio in which x divides line MB. (2mks)

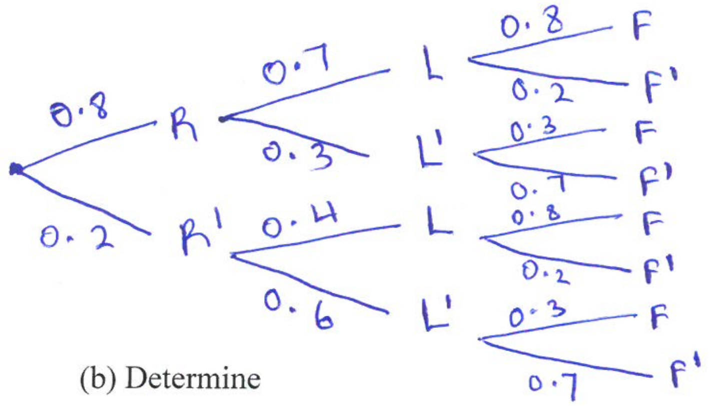
$1-r : r$

$\frac{3}{4} : \frac{1}{4}$ ✓M1

$3 : 1$ ✓A1

24. The probability that it rains on a certain day is 0.8. if it rains the probability that Onguti comes to school late is 0.7 but otherwise it is 0.4. if he comes to school late, the probability that he fails an exercise is 0.8 but if he comes early the probability of failing an exercise is 0.3

(a) Draw a tree diagram to represent this information (2mks)



✓ B2.

(b) Determine

(i) The probability that it rains, he comes to schools early and he fails the exercise (2mks)

$P(R L' F)$

$0.8 \times 0.3 \times 0.3$ ✓ M1

0.072 ✓ A1

(ii) The probability that he passes his exercise (2mks)

$P(RLF')$ or $P(RL'F')$ or $P(R'LF')$ or $P(R'L'F')$

$(0.8 \times 0.7 \times 0.2) + (0.8 \times 0.3 \times 0.7) + (0.2 \times 0.4 \times 0.2) + (0.2 \times 0.6 \times 0.7)$ ✓ M1

$= 0.38$ ✓ A1

(iii) The probability that he comes to school late (2mks)

$P(RL)$ or $P(R'L)$

$= (0.8 \times 0.7) + (0.2 \times 0.4)$ ✓ M1

$= 0.64$ ✓ A1

(iv) The probability that he comes to schools late and he passes his exercise (2mks)

$P(RLF')$ or $P(R'LF')$

$(0.8 \times 0.7 \times 0.2) + (0.2 \times 0.4 \times 0.2)$ ✓ M1

$= 0.128$ ✓ A1