SECTION A (02 marks each)

1. Work out:

$$\begin{array}{r} 346 \\ +148 \\ \hline 494 \end{array}$$ B2

2. Write 96 in Roman numerals.

96 = 90 + 6

XC VI M1

XCVI A1

3. Convert 17_{ten} to binary base.

B	N	R
2	17	1
2	8	0
2	4	0
2	2	0
	1	

M1

10001_{two} A1

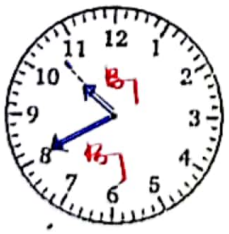
4. Write 637 in standard form

637 ÷ 10 M1

63.7 ÷ 10

6.37×10^2 A1

5. On the clock face below, show 20 minutes to 11 O'clock.



6. Solve: $3^{2a} \div 81 = 1$

$3^{2a} \div 3^4 = 3^0$ M1

$3^{2a-4} = 3^0$

$2a - 4 = 0$

$2a = 0 + 4$

$\frac{2a}{2} = \frac{4}{2}$

$a = 2$ A1

7. Given that set K={a, b, c}, how many subsets has set K?

No. of subsets $= 2^n$

$= 2^3$ M1

$= 2 \times 2 \times 2$

$= 4 \times 2$

$= 8$ subsets A1

8. List down the prime factors of 144.

2	144
2	72
2	36
2	18
3	9
3	3
	1

M1

$\{2_1, 2_2, 2_3, 2_4, 3_1, 3_2\}$ A1

9. Given that $p = \frac{1}{2}$, $q = \frac{2}{3}$ and $r = \frac{1}{4}$, find the value of $p + qr$.

$\frac{1}{2} + \left(\frac{1}{3} \times \frac{1}{4}\right)$ M1

$\frac{1}{2} + \frac{2}{12}$

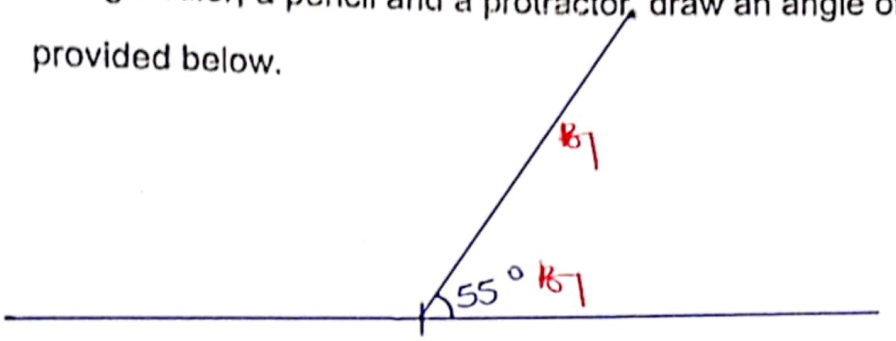
$\frac{(6 \times 1) + (1 \times 2)}{12}$

$\frac{6+2}{12}$

$\frac{8}{12}$

$\frac{3}{4}$ A1

10. Using a ruler, a pencil and a protractor, draw an angle of 55^0 in the space provided below.



B1 B1

11. Simplify: $\frac{3}{4} + 1\frac{1}{2}$

$\frac{3}{4} + \frac{3}{2}$

$\frac{(1\times3) + (2\times3)}{4}$

$\frac{3+6}{4}$ M1

$\frac{9}{4}$

$= 2\frac{1}{4}$ A1

12. If today is Wednesday, what day of the week it be 40 days from now?

3 + 40 = — (Finite 7) M1

$\frac{43}{7}$ = — (Finite 7)

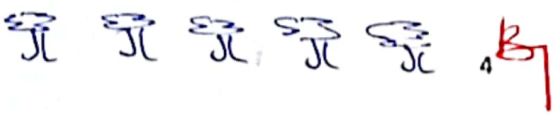
6 rem ① = — (Finite 7)

Monday. A1

13. If  represents 12 trees, draw such pictures to represent 60 trees

$\frac{60}{12}$

5 B1

 B1

14. The base area of a cylindrical tin is $308cm^2$. Calculate its volume if its height is 15cm.

$V = BA \times H$

$V = 308cm^2 \times 15cm$ M1

$V = 4620cm^3$ A1

15. A trader sold an article at sh.7900 making a profit of sh.700. Calculate the cost price of the article.

$cp = sp - p$

$cp = sh.7900 - 700$ M1

$cp = sh.7200$ A1

16. Find the least number of books given to 12 or 15 pupils and 3 books remain.

2	12	15
2	6	15
3	3	15
5	1	5
	1	1

$(2 \times 2 \times 3 \times 5) + 3$ M1

$(4 \times 15) + 3$

$60 + 3$

63 books A1

17. Increase 8400 kg by $12\frac{1}{3}\%$

$\frac{12\frac{1}{3} \times 8400kg}{100}$

$12\frac{1}{3} \times 84kg$

$\frac{37}{3} \times 84kg$

$37 \times 28kg$

$1036kg$ B1

$8400kg + 1036kg$

$9436kg$ B1

18. Calculate the circumference of a circular garden whose diameter is 28cm.

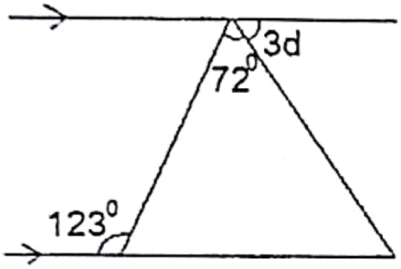
$C = \pi d$

$C = \frac{22}{7} \times 28cm$ M1

$C = 22 \times 4cm$

$C = 88cm$ A1

19. Find the value of d in the figure below;



$3d + 72^\circ = 123^\circ$ M1

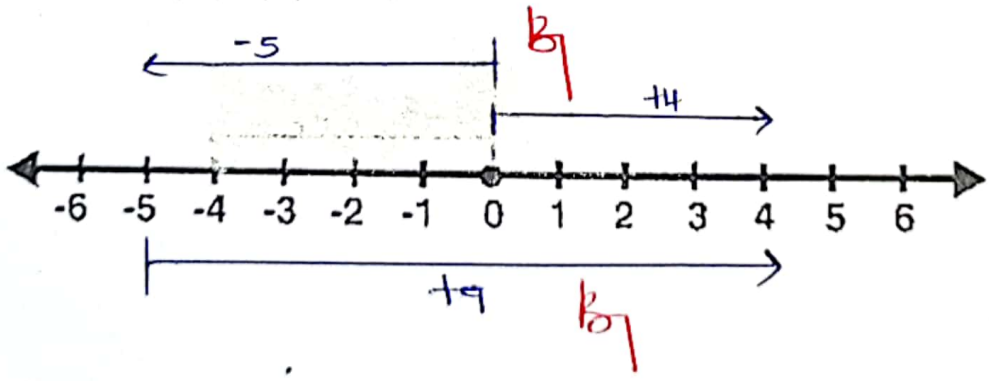
$3d + 72^\circ - 72^\circ = 123^\circ - 72^\circ$

$3d = 51^\circ$

$\frac{3d}{3} = \frac{51^\circ}{3}$

$d = 17^\circ$ A1

20. Work out (+4)− (-5) using a number line below

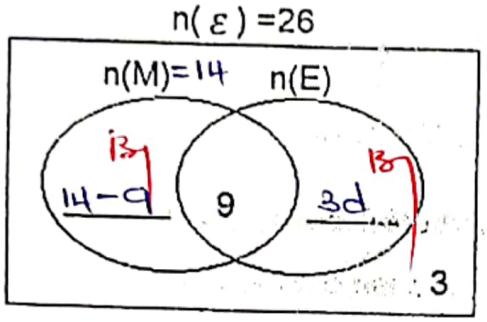


B1 B1

SECTION B: (60 *Marks*)

21. In a school of 26 teachers, 14 teach Maths(M), 3d teach English (E) only, 9 teach both subjects while 3 teach other subjects.

a) Complete the Venn diagram using the above information. (02 *marks*)



b) How many teachers teach in English? (02 *marks*)

$14+3+3d = 26$

$17+3d = 26$

$3d = 26-17$

$3d = 9$

$\frac{3d}{3} = \frac{9}{3}$

$d = 3$

$9+3d$

$9+(3\times3)$

$9+9$

18 teaches

c) Find the probability of choosing at random a teacher who teaches one subject (01 *mark*)

$ESP = 26$

$DC = (14-9)+(3\times3)$

$= 5+9$

$= 14$

$P = \frac{DC}{ESP}$

$P = \frac{14}{26}$

22. The sum of three consecutive odd numbers is 75. If the first number is K,

a) Find the value of K. (03 *marks*)

1st no	2nd no	3rd no	sum
K	K+2	K+4	75

$K+K+2+K+4 = 75$ m1

$K+K+K+2+4 = 75$

$3K+6 = 75$

$3K+6-6 = 75-6$ m1

$3K = 69$

$\frac{3K}{3} = \frac{69}{3}$

$K = 23$ A1

b) Work out their range. (02 *marks*)

$H = K+4$

$H = 23+4$

$H = 27$

$L = K$

$L = 23$

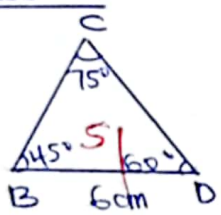
$R = H - L$

$R = 27 - 23$ m1

$R = 4$ A1

23. a) Using a ruler and a pair of compasses, construct a triangle BCD where BD = 6cm, angle BCD = 75° and angle DBC = 45°. (04 *marks*)

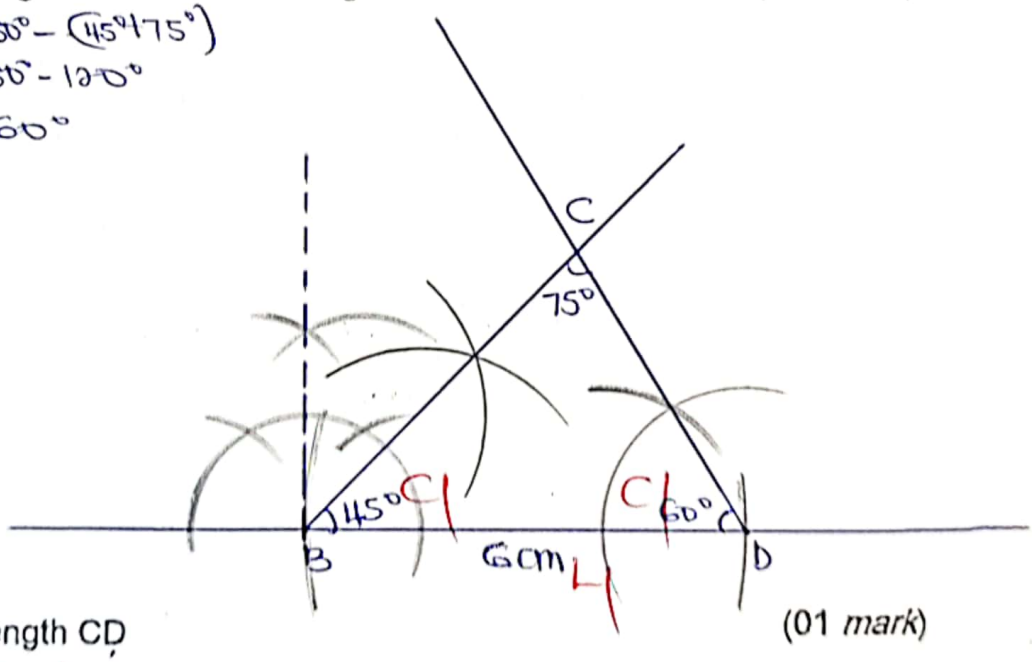
Sketch



$\angle D = 180° - (45° + 75°)$

$\angle D = 180° - 120°$

$\angle D = 60°$



b) Measure length CD (01 *mark*)

± 4.5cm 1a

24. a) Work out: (02 *marks*)

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 4\,3\,2_{five} \\ +\,1\,3\,4_{five} \\ \hline 1\,1\,2\,1 \end{array}$$

$6+5 = 1\text{rem } 1$

$7+5 = 1\text{rem } 2$

$6+5 = 1\text{rem } 1$

1121_{five} A1

b) Given that $46_p = 202_{five}$, find the value of p. (03 *marks*)

$(4\times p^1)+(6\times p^0) = (2\times 5^2)+(2\times 5^0)$ M1

$(4\times p)+(6\times 1) = (2\times 5\times 5)+(2\times 1)$

$4p+6 = 50+2$

$4p+6 = 52$

$4p+6-6 = 52-6$ M1

$4p = 46$

$\frac{4p}{4} = \frac{46}{4}$

$p = 11\frac{1}{2}$ A1

25. a) Express 0.233....to a common fraction in its lowest terms. (02 *marks*)

$0.233\ldots$

$\rightarrow \frac{23}{100}$

$0.2333\ldots$

$\rightarrow \frac{2}{10}$

$\frac{23-2}{100-10}$ M1

$\frac{21}{90}$

$\frac{7}{30}$ A1

b) Simplify: $\frac{16.2-9.95}{1.25\times 0.05}$ (03 *marks*)

16.20
-9.95
6.25 K1

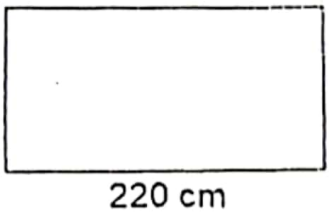
$\frac{6.25}{1.25\times 0.05}$

$\frac{625}{100} \div \left(\frac{125}{100}\times\frac{5}{100}\right)$ M1

$\frac{625}{100}\times\frac{100}{125}\times\frac{100}{5}$

100 A1

26. A piece of metal below was folded to form a cylindrical container.



a) Calculate the area of the piece of metal above. (02 *marks*)

$A = L \times L$

$A = 220\,cm \times 100\,cm$ M1

$A = 22000\,cm^2$ A1

b) Work out the volume of the cylindrical container formed. (take $\pi = \frac{22}{7}$) (03 *marks*)

$2\pi r = c$

$2 \times \frac{22}{7} r = 220$ M1

$\frac{44r}{7} = 220$

$7 \times \frac{44r}{7} = 220 \times 7$

$\frac{44r}{44} = \frac{220 \times 7}{44}$

$r = 35cm$ A1

$V = \pi r^2 h$

$V = \frac{22}{7} \times 35 \times 35 \times 100$

$V = 22 \times 5 \times 35 \times 100$

$V = 110 \times 3500$

$V = 385000\,cm^3$ B1

27. a) Simplify: $\frac{6m^8 \times 4m^3}{8m^4}$ (02 *marks*)

$\frac{\cancel{6}^{3} \times m^8 \times \cancel{4}^{1} \times m^3}{\cancel{8} \times m^4}$ M1

$\cancel{2}$
1

$\frac{3 \times m \times m \times m \times m \times m \times m \times m \times m \times \cancel{m} \times \cancel{m} \times \cancel{m}}{\cancel{m} \times \cancel{m} \times \cancel{m} \times \cancel{m}}$

$3 \times m \times m \times m \times m \times m \times m \times m$

$3m^7$ A1

b) Solve: $\frac{3p+1}{4} = \frac{p+2}{3}$ (03 *marks*)

$3(3p+1) = 4(p+2)$ M1

$9p+3 = 4p+8$

$9p-4p = 8-3$ M1

$5p = 5$

$\frac{5p}{5} = \frac{5}{5}$

$p = 1$ A1

28. Rose went to market and bought the items as shown in the table below;

a) Complete the table below. (04 *marks*)

Item	Quantity	Unit cost	Amount
Wheat flour	2 packets	Sh.7,000 each	Sh..14000.. B1
Cooking oil	$1\frac{1}{2}$ litres	Sh....9000....a litre	Sh.13,500
Rice	....3.... B1 ..kg	Sh.3,600	Sh..10800.... B1
		TOTAL	Sh.38,300

Wheat Flour
sh. 7000 x 2
sh. 14000

cooking oil
13500 ÷ $1\frac{1}{2}$
13500 x $\frac{2}{3}$
sh. 9000

sh. 38300 - (14000 + 13500)
sh. 38300 - 27500
sh. 10800

Rice
10800
3600
3kg

b) If she was given a change of sh.11,700 , how much money did she have before shopping? (01 *mark*)

sh. 38 300
+ sh. 11 700
sh. 50,000 B1

29. The interior angle sum of a regular polygon is 1440^0.

a) Calculate the number of sides of the polygon. (03 *marks*)

$180^\circ(n-2) = 1440^\circ$ M1

$180n - 360^\circ = 1440^\circ$

$180n - 360^\circ + 360^\circ = 1440^\circ + 360^\circ$ M1

$180n = 1800^\circ$

$\frac{180n}{180} = \frac{1800^\circ}{180}$

$n = 10$

$= 10$ sides A1

b) Work out the size of its exterior angle. (02 *marks*)

Each $= \frac{360^\circ}{\text{No. of sides}}$

$= \frac{360^\circ}{10}$ M1

$= 36^\circ$ A1

30. Tom had of a $\frac{3}{4}$ sugarcane and gave $\frac{1}{9}$ of it to Bashirah.

a) What fraction did he remain with? (03 *marks*)

$\frac{3}{4} \times \frac{1}{9}$

$\frac{1}{12}$ B1

$\frac{3}{4} - \frac{1}{12}$

$\frac{(3\times3) - (1\times1)}{12}$

$\frac{9-1}{12}$ M1

$\frac{8}{12}$

$\frac{2}{3}$ A1

b) If the part he remained with was 400cm long, find the total length of the sugarcane. (02 *marks*)

$\frac{2}{3} \longrightarrow 400cm$

$400cm \div \frac{2}{3}$ M1

$400cm \times \frac{3}{2}$

$200cm \times 3$

$600cm$ A1

31. a) Express 25m/sec to km/h. (02 *marks*)

$1000m = 1km$

$25m = \frac{25\,km}{1000}$

$3600s = 1h$

$1s = \frac{1h}{3600}$

$\frac{25}{1000} \div \frac{1}{3600}$ M1

$\frac{25}{1000} \times \frac{3600}{1}$

$90km/h$ A1

b) A motorist covered a journey at a speed of 54km/h in $4\frac{1}{2}$ hours. How long will the motorist take to cover the same distance at a speed of 81km/h? (03 *marks*)

$S = 54km/h \quad T = 4\frac{1}{2}h$

$D = 243km$

$D = S \times T$

$D = (54 \times 4\frac{1}{2})km$

$D = 243km$ B1

$S = 81km/h \quad T = ?$

$D = 243km$

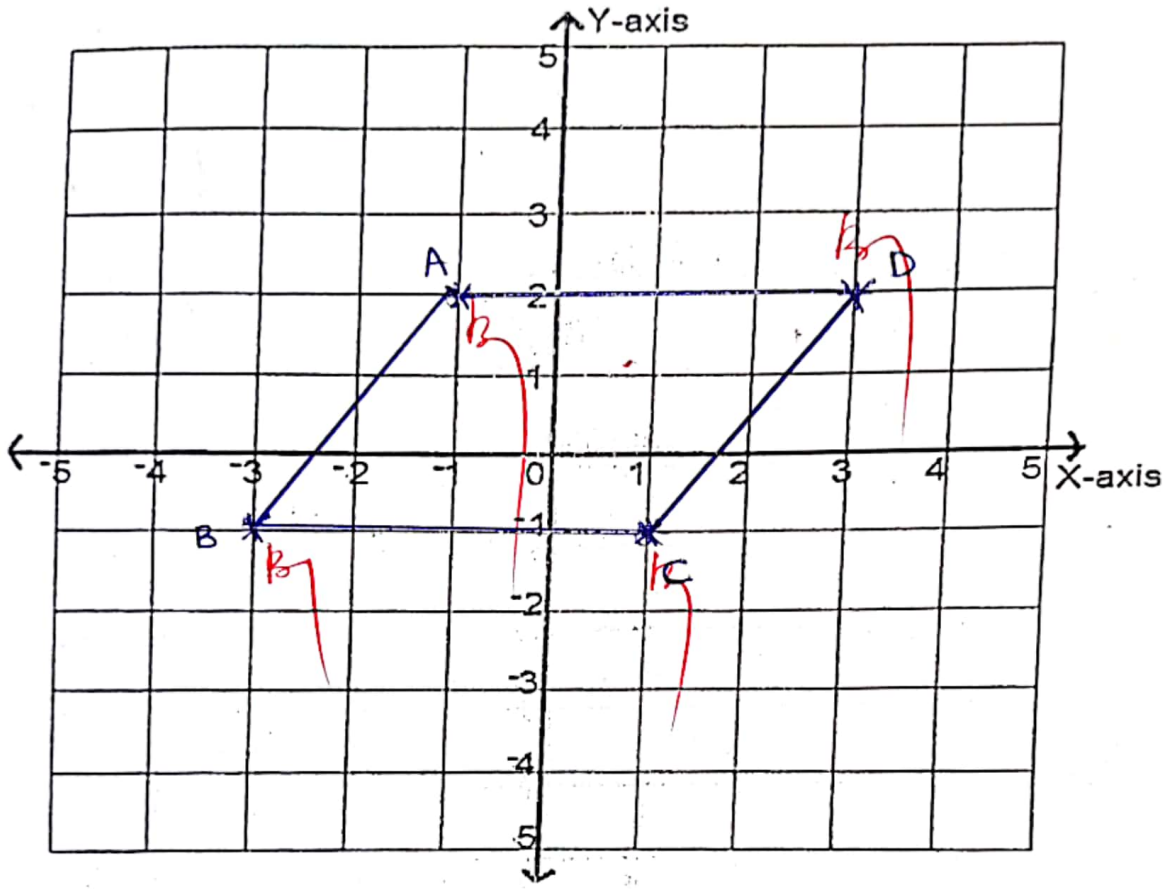
$T = \frac{D}{S}$

$T = (\frac{243}{81})h$ M1

$T = 3hours$ A1

32. a) On the coordinate graph below, plot the following points: (03 *marks*)

A(-1,2) , B(-3, -1) and C(1, -1)



b) Plot point D and join A to B, B to C, C to D and D to A such that the figure formed is a parallelogram. (01 *mark*)

c) State the coordinates of point D. (01 *mark*)

D(3, 2) B

END