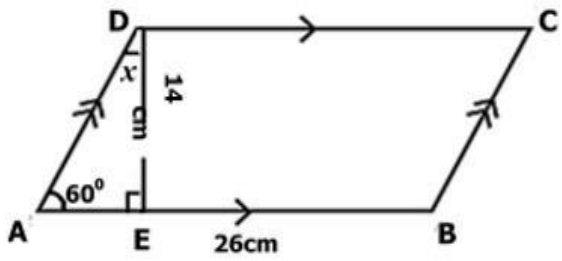
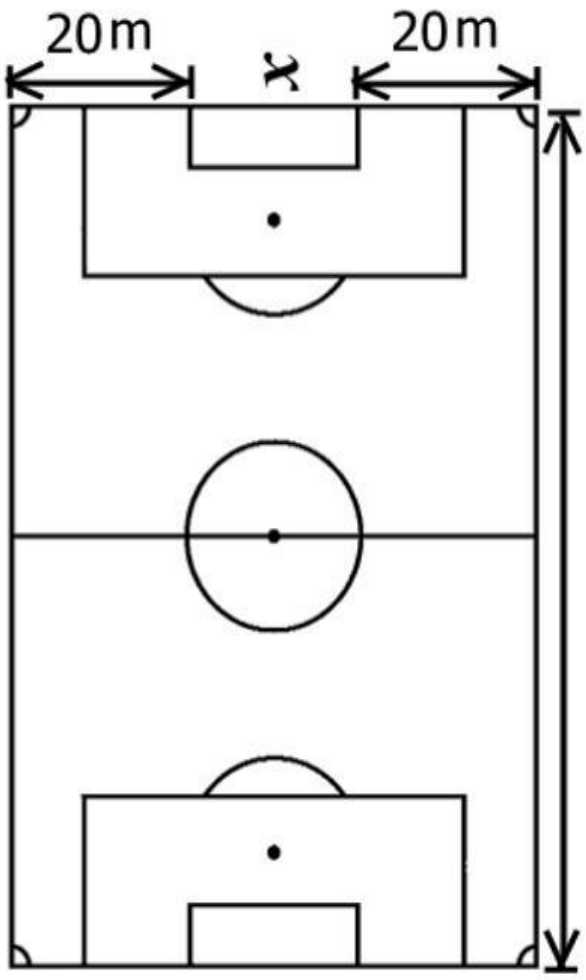
SUREKEY

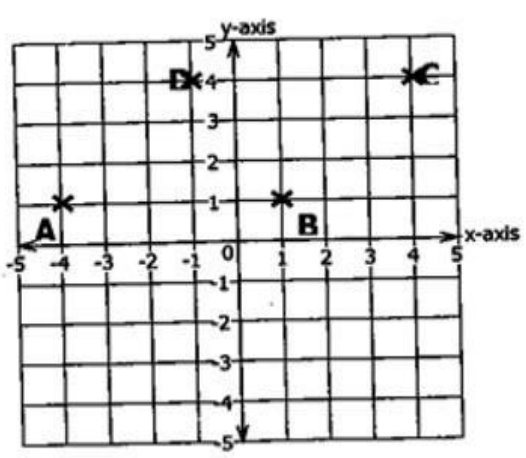
PLE PREPARATION EXAMINATION

MATHEMATICS

SET 3







OFFICIAL MARKING GUIDE

Let Quality speak for itself

 0700758668

SECTION A: 40 MARKS

Answer **all** questions in this Section

Questions 1 to **20** carry two marks each

1. Add:
$$\begin{array}{r} 723 \\ +\ 264 \\ \hline 987 \\ \hline \end{array}$$

3 + 4 = 7
2 + 6 = 8
7 + 2 = 9

Topic: Operation on Whole Numbers Class: P.2 Level: K

2. Write in figures; Twenty seven thousand forty.

Topic: Operation on Whole Numbers Class: P.4 Level: C

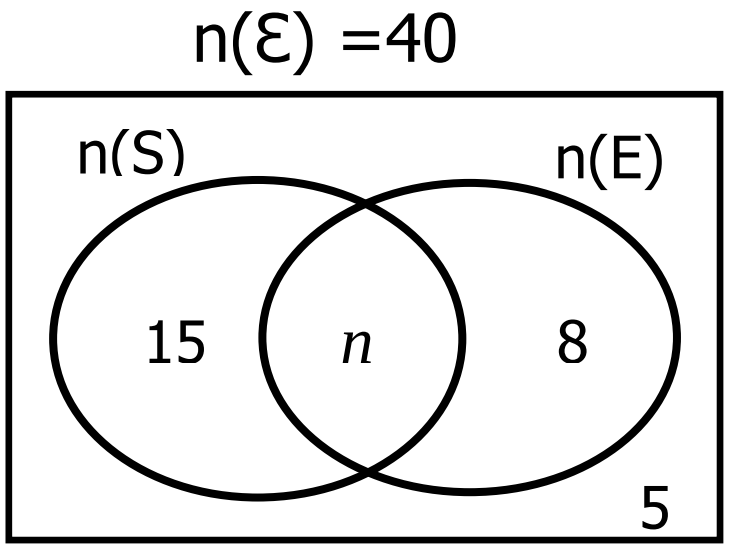
Twenty seven thousand – 27,000
Forty – + 40
Twenty seven thousand forty. – 27,040

OR

Thousands			Units		
H	T	O	H	T	O
0	2	7	0	4	0

= 27,040

3. Study the Venn diagram below and find the value of n.



Topic: Set Concepts Class: P.6 Level: A

15 + n + 8 + 5 = 40
(15 + 8 + 5) + n = 40
28 + n = 40
28 – 28 + n = 40 – 28
n = 12

OR
n = 40 – (15 + 8 + 5)
n = 40 – 28
n = 12

4. Write the next number in the sequence below as a Roman numeral.

4, 9, 16, 25, 36
+5 +7 +9 +11
25 + 11 = 36

As a Roman Numeral
36 → XXVI

OR 4, 9, 16, 25, 36
2^2 3^2 4^2 5^2 6^2
6 x 6 = 36

As a Roman Numeral
36 → XXVI

5. At what speed should Messi run around the field if he is to cover a distance of 6km in 90 minutes of playing football?

Topic: Operation on Whole Numbers Class: P.6 Level: C

D = 6km
T = 90 minutes
S = ??

Time in hrs
60min = 1hr
90min = $\frac{\cancel{90}^{3}}{\cancel{60}_{2}}$hr
= $\frac{3}{2}$hr

Speed = $\frac{\text{Distance}}{\text{Time}}$

Speed = 6km ÷ $\frac{3}{2}$hr

Speed = $\cancel{6}^{2}$km x $\frac{2}{\cancel{3}_{1}}$hr

Speed = 2km x $\frac{2}{1}$hr

Speed = 4km/hr

OR: Speed = $\frac{\text{Distance}}{\text{Time}}$

Speed = $\frac{6\text{km}}{90\text{min}}$

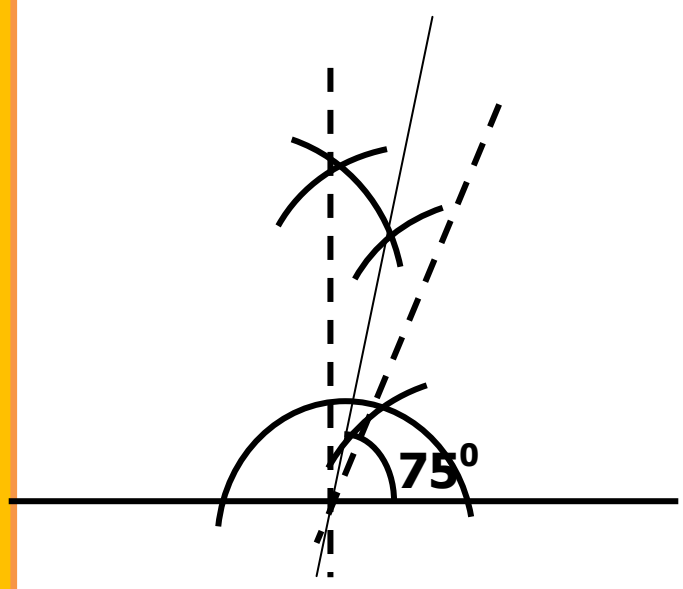
Speed = $\frac{\cancel{6}^{2}\text{km}}{\cancel{90}_{30}\text{min}}$

Speed = $\frac{\cancel{2}^{1}\text{km}}{\cancel{30}_{15}\text{min}}$

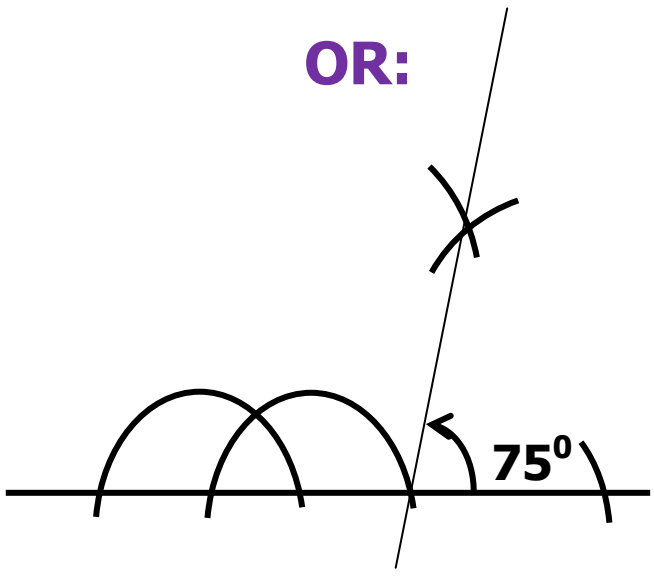
Speed = $\frac{1}{15}$ km/min

6. Using a ruler, a sharp pencil and a pair of compasses only, construct an angle of 75^0 in the space below.

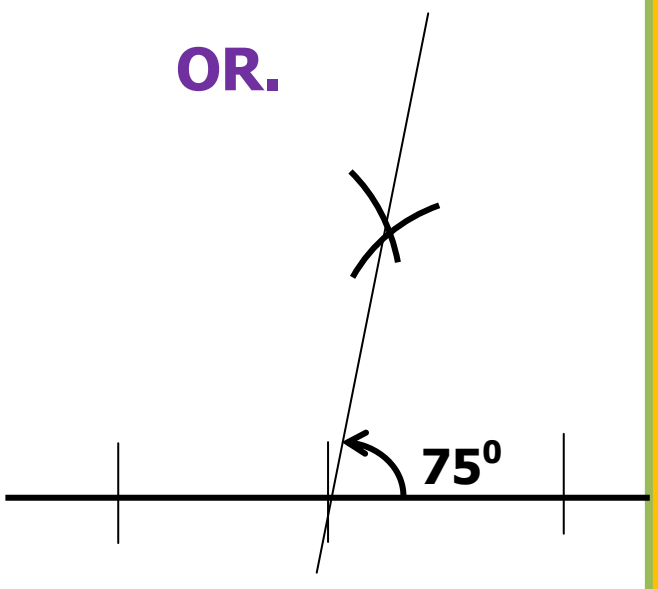
Topic: Lines, Angles and Geometric figures Class: P.6 Level: A



OR:



OR.



7. Given that $y=^{-}4$, $p=^{-}3$, work out the value of $3y^2 - 5py^2$

Topic: Algebra Class: P.6 Level: C

$3y^2 - 5py^2$

$3 \times y \times y - 5 \times p \times y \times y$

$3 \times (^{-}4 \times ^{-}4) - 5 \times ^{-}3 \times (^{-}4 \times ^{-}4)$

$3 \times ^{+}16 - ^{-}15 \times ^{+}16$

$^{+}48 - ^{-}16$

$^{+}48 - (^{-}240)$

$^{+}48 + 240$

288

Remember

$^{-} \times ^{+} = ^{-}$

$^{+} \times ^{-} = ^{-}$

$^{+} \times ^{+} = ^{+}$

$^{-} \times ^{-} = ^{+}$

8. How many tins of 500grams would one get from a 4 kilogram tin of KIMBO?

Topic: Mass, Length and Capacity Class: P.5 Level: C

Grams to Kilograms

1000g = 1 kg

500g = $\left(\frac{500\cancel{1}}{1000\cancel{2}}\right)$ kg

= $\frac{1}{2}$ kg

Number of tins

4kg ÷ $\frac{1}{2}$ kg

4$\cancel{kg}$ x $\frac{2}{1\ \cancel{kg}}$

4 x 2

= 8 tins

OR

Number of tins

1kg = 1000g

4kg ÷ $\left(\frac{500\ 1}{1000\cancel{2}}\right)$ kg

4$\cancel{kg}$ x $\frac{2}{1\ \cancel{kg}}$

4 x 2

= 8 tins

9. Find the probability of Sarah going to the market if she usually goes there on a day beginning with letter **T.**

Topic: Data Handling Class: P.4 Level: C

Total chances

M (T) W (T) F S S

n(T.C) = 7

Possible chances

Tuesday, Thursday

n(P.C) = 2

Probability = $\frac{n(P.C)}{n(T.C)}$

Probability = $\frac{2}{7}$

10. What number is written in standard form as 1.9×10^3?

Topic: Number Patterns and Sequence Class: P.5 Level: C

1.9×10^3 = 1.9 x 10 x 10 x 10

= $\frac{19}{1\cancel{0}}$ x 100$\cancel{0}$

= 19 x 100

= 1900

11. Find the least number of sweets which can be shared by 12 boys or 15 boys leaving a remainder of 4.

Topic: Number Patterns and Sequence Class: P.6 Level: C

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

LCM + Remainder

(2 x 2 x 3 x 5) + 4

60 + 4

= 6 4 sweets

OR: Using Finite

4(finite 12) = 16, 28, 40, 52, (64), 76

4(finite 15) = 19, 34, 49, (64), 79, 94

= 6 4 sweets

12. How much simple interest on Sh.240,000 at a rate of $4\frac{1}{2}$% per month would Sam pay to a Micro finance bank after 3 months?

Topic: Fractions (Money) Class: P.6 Level: C

Principal = Sh240,000
Rate = 4½% / $\frac{9}{2}$ %
Time = 3 months
Interest = ??

$S.I = P \times \frac{R}{100} \times \frac{T}{12}$

$S.I = Sh240,000 \times \frac{9}{2} \div \frac{100}{1} \times 3$

$S.I = Sh\frac{240,000}{1200} \times \frac{9}{2_1} \times \frac{1}{100_1} \times \frac{3}{1}$

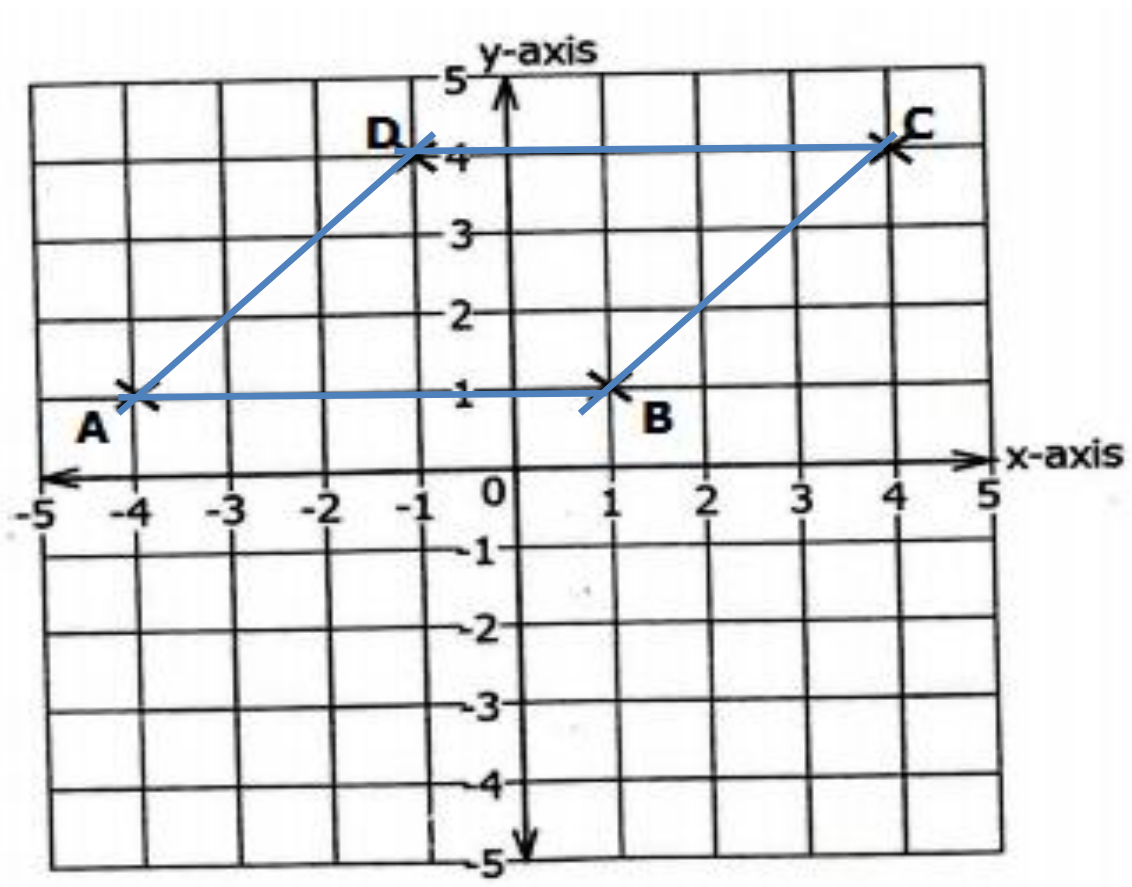
S.I = Sh(1,200 x 9 x 1) x 3
S.I = Sh10,800 x 3
S.I = Sh32,400

13. Workout the sum of 7.5 and 5.

Topic: Fractions Class: P.5 Level: C

Sum
7 . 5
+5 . 0
12 . 5

14. In the graph below, join point **A** to **B**, **B** to **C**, **C** to **D** and **D** to **A**.



Topic: Data Handling Class: P.7 Level: C

Name the polygon **ABCD** formed.

Parallelogram. **OR** Quadrilateral

15. Workout the difference of the 6^{th} and 4^{th} triangular numbers.

Topic: Number Patterns and Sequence Class: P.5 Level: C

Triangular Numbers

1 =1
1+2=3
1+2+3=6
1+2+3+4=10
1+2+3+4+5=15
1+2+3+4+5+6=21

Difference
21 – 10
= 11 .

OR: Using the formula $\frac{n(n+1)}{2}$

6^{th}

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

$\frac{6(7)}{2} = \frac{\cancel{42}^{21}}{\cancel{2}_{1}}$

= 21

4^{th}

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

$\frac{4(5)}{2} = \frac{\cancel{20}^{10}}{\cancel{2}_{1}}$

= 10

Difference
21 – 10
= 11

16. In a school of 540 pupils, 20% of them are boys and the rest are girls. Find the number of girls in the school.

Topic: Fractions (Percentages) Class: P.6 Level: C

Boys	Girls	Tot
20%	(100% - 20%) = 80%	100% 540

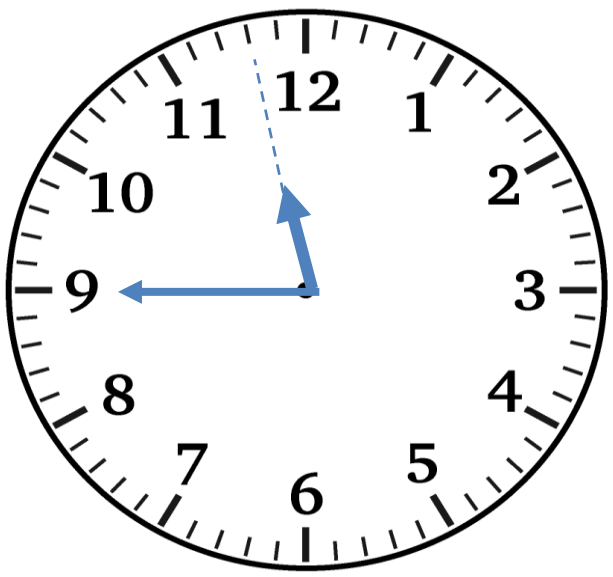
Number of girls
$\frac{\cancel{80}}{\cancel{100}}$ x $\cancel{540}$
8 x 54
= 432 girls

OR: Number of boys
$\frac{\cancel{20}}{\cancel{100}}$ x $\cancel{540}$
2 x 54
= 108 boys

Number of girls
540
–108
432 girls

17. Show fifteen minutes before midnight on the clock face below.

Topic: Time Class: P.6 Level: C



Hrs.	Mins
12	00
–0	15
11	45

11:45pm

18. Solve the inequality: $2x - 9 > 3 - x$.

Topic: Algebra (Inequalities) Class: P.7 Level: C

$2x - 9 > 3 - x$

$2x - 9 + 9 > 3 - x + 9$

$2x > 3 + 9 - x$

$2x + x > 12 - x + x$

$3x > 12$

$\frac{3^1x}{3_1} > \frac{12^4}{3_1}$

$x > 4$

19. The average weight of four boys is 56kg, when two teachers join them, their average weight becomes 52kg. Find the weight of the two teachers.

Topic: Data Handling Class: P.6 Level: C

Total weight of four boys
4 x 56kg
=224kg

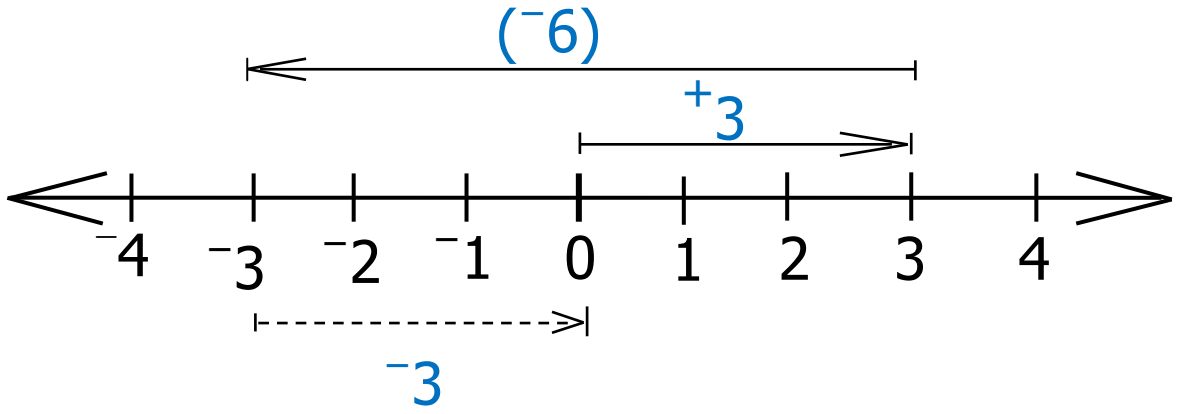
When teachers join
4boys + 2 teachers
=6 people

Total weight when teachers join
6 x 52kg
=312kg

Weight of the two teachers
312kg – 224kg
= 88kg

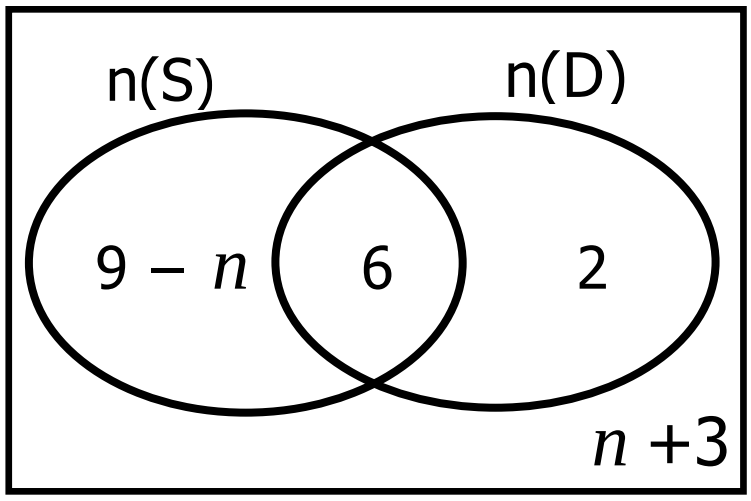
20. Workout: $^{+}3 + {}^{-}6$ on the number line below.

Topic: Integers Class: P.5 Level: C



SECTION B: 60 MARKS

21. The Venn diagram below shows the number of pupils who like singing (S) and others dancing (D), the rest like neither of the two.



(a) If 7 pupils like neither singing nor dancing, find the value of n. (02 Marks)

Topic: Set Concept Class: P.6 Level: C & C

$n + 3 = 7$

$n + 3-3 = 7 - 3$

$n = 4$.

(b) How many pupils don't like dancing? (02 Marks)

$n(D)' = 9 - n + n + 3$

$= (9 - 4) + (4 - 3)$

$= 5 + 1$

$= 6$ pupils

22. (a) Simplify: 4 boys + 3 girls – 2boys + 2 girls. (02 Marks)

Topic: Algebra Class: P.7 Level: C & A

4 boys + 3 girls – 2boys + 2 girls.

4 boys – 2boys + 3 girls + 2 girls.

2boys + 5girls .

(b) Kalibbala is 24 years old and his brother Kabali is 6 years old. After how many years will Kalibbala be three times as old as his brother Kabali? (04 Marks)

Now

Kalibbala – 24years

Kabala – 6 years

After x years

Kalibbala – $24 + x$

Kabala – $6 + x$

Number of years

$24 + x = 3(6 + x)$

$24 + x = 18 + 3x$

$24 + x - x = 18 - 18 + 3x$

$24 - 18 = 3x - x$

$6 = 2x$

$\frac{6^3}{2_1} = \frac{2^1 x}{2_1}$

$3 = x$

$x = 3$ years

After 3 years

23. Rose went for shopping and bought the following items

4kg of sugar at Sh.12,000.
2 litres of cooking oil at Sh.11,000.
3 bars of soap.

Topic: Money Class: P.6 Level: C & C

(a) How much did she pay for sugar and cooking oil? (02 Marks)

Sugar
Sh.12,000.
Cooking oil
Sh.11,000.

Total cost
Sh.12,000.
+ Sh.11,000.
Sh.23,000.

(b) If Rose paid sh. 32,000 for all the items, how much did she pay for each bar of soap? (02 Marks)

Cost of 3 bars
Sh.32,000.
– Sh.23,000.
Sh. 9,000.

Cost of each bar
3 bars cost Sh.9,000.
1 bar will cost Sh. $\frac{{}^{3}\cancel{9},000.}{\cancel{3}_{1}}$
She paid Sh.3,000 for each bar of soap

---

24. (a) Workout: $133_{five} - 42_{five}$ (02 Marks)

Topic: Whole Numbers Class: P.5 Level: C & C

$$\begin{array}{r} {}^{0}\cancel{1}{}^{5}\cancel{3}\ 3_{five} \\ -\ \ 4\ 2_{five} \\ \hline 0\ 4\ 1_{five} \end{array}$$

3 – 2 = 1
5 + 3 = 8
8 – 4 = 4

(b) The table below shows addition in base two. Study it carefully and complete it correctly. (03 Marks)

+	0	1	2
0	0	1	10
1	1	10	11
2	10	11	100

0 + 2 = 2
2 ÷ 2 = **1r 0**

1 + 0 = **1**

2 + 1 = 3
3 ÷ 2 = **1r 1**

25. On a day when $\frac{1}{6}$ of the pupils in the class were absent, 35 pupils were present. How many pupils were present when $\frac{1}{7}$ of the pupils in the class were absent? (05 Marks)

Topic: Fractions Class: P.7 Level: C & C

Fractions

Absent $-\frac{1}{6}$

Present $-\frac{6}{6}-\frac{1}{6}=\frac{5}{6}$ Equals to 35 pupils

Number of pupils in the class

$35 \div \frac{5}{6}$

$\cancel{35}^{7} \times \frac{6}{\cancel{5}_{1}}$

7×6

42 pupils

OR: 5 parts rep 35 pupils

1 part rep $\frac{\cancel{35}^{7}}{\cancel{5}_{1}}$

7 pupils

6 parts rep 7×6

$=$ 42 pupils

OR: Let the total no.of pupils be k

$\frac{5}{6} \times k = 35$ pupils

$\frac{\cancel{6}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{5}^{1}}{\cancel{6}_{1}} k = \frac{\cancel{35}^{7}}{\cancel{5}_{1}} \times \frac{6}{1}$

$k = 7 \times 6$

$k = 42$ pupils

Absent $-\frac{1}{7}$

Present $-\frac{7}{7}-\frac{1}{7}=\frac{6}{7}$

Number of pupils present

$\frac{6}{\cancel{7}_{1}} \times \cancel{42}^{6}$

6×6

36 pupils

OR: 7 parts rep 42pupils

1 part rep $\frac{\cancel{42}^{6}}{\cancel{7}_{1}}$

$= 6$ pupils

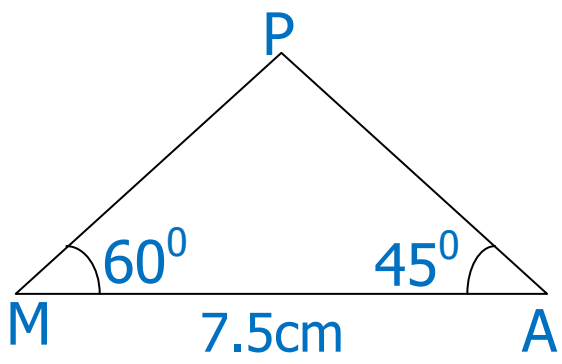
6 parts rep 6×6

$=$ 36 pupils

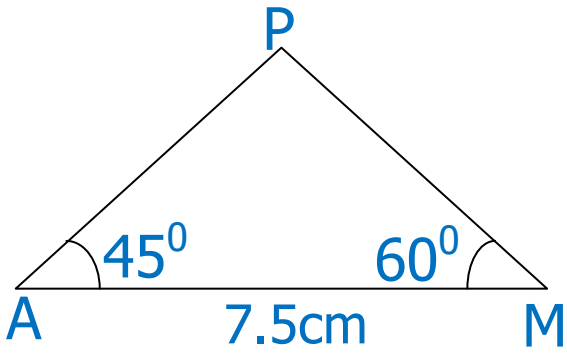
26. (a) Using a ruler, a pencil and a pair of compasses only, Construct triangle MAP where $\angle M = 60^0$ length MA = 7.5cm and $\angle A = 45^0$. (04 Marks)

Topic: Lines, Angles and Geometric figures Class: P.6 Level: A

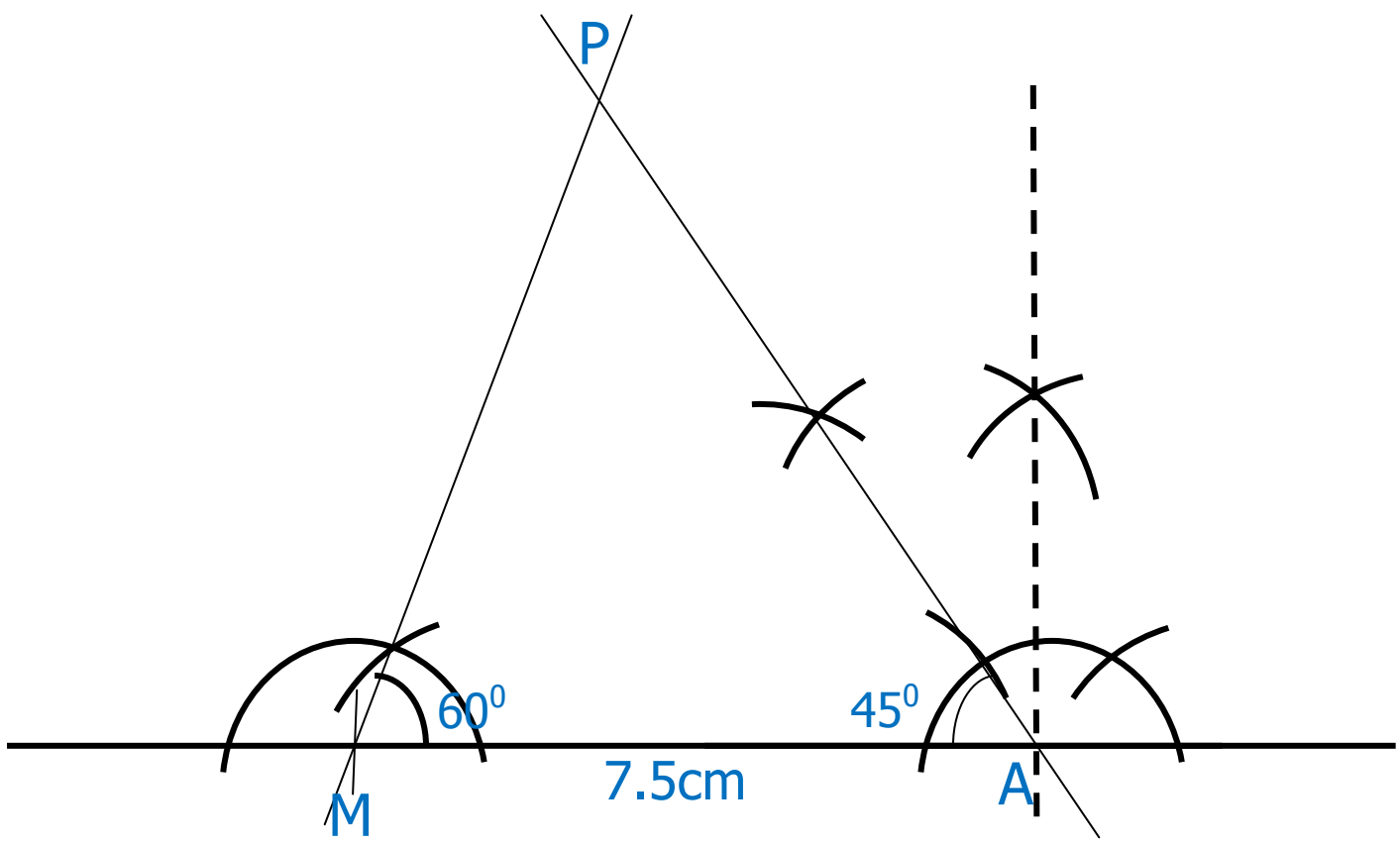
Sketch



OR:

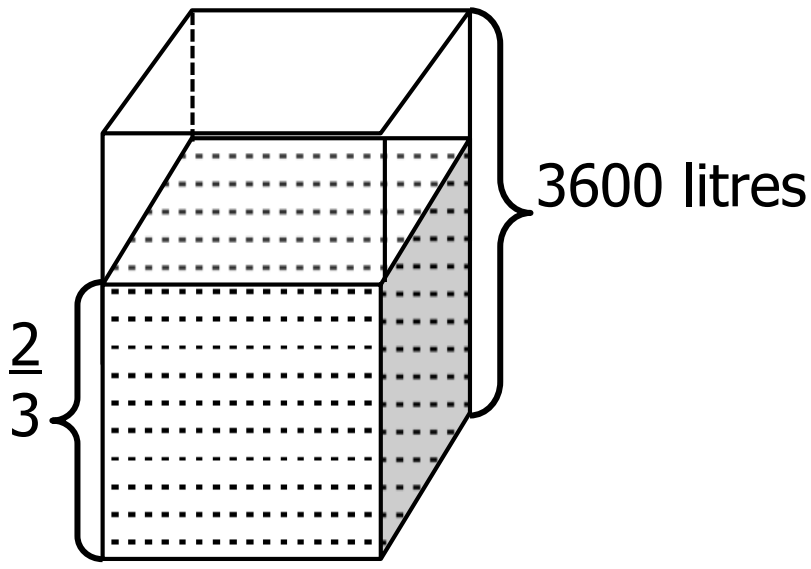


Accurate diagram



(b) Measure the length AP 6.7 or 6.8 or 6.9cm. (01 Mark)

27. The milk tank below holds a capacity of 3600 litres when completely full. When James sold some litres of it at sh.1,200 per litre, it became $\frac{2}{3}$ full.



Topic: Length, Mass and Capacity Class: P.6 Level: A & A

(a) How many litres of milk did James sell for the tank to become $\frac{2}{3}$ full? (03 Marks)

Full capacity is 3600 litres

Remaining Fraction – $\frac{2}{3}$

Fraction sold – $\frac{3}{3} - \frac{2}{3} = \frac{1}{3}$

Capacity sold

$\frac{1}{3}$ x 3600 (1200) litres

$\frac{3}{3_1}$

1 x 1200

1200 litres

OR: 3 parts rep 3600 litres

1 part rep $\frac{3600^{1200}}{3_1}$

= 1200 litres

He sold 1200 litres

(b) How much did James earn from the sold milk? (02 Marks)

1 litre costs sh.500

1200 litres will cost (sh1,200 x 1200)

=sh.1,440,000

28. 5 builders can build a classroom block in 8 months, if each builder is paid shs.20,000 per day.

(a) How much money is required to pay the builders if they Worked from 1st March up to 30th June? (04 Marks)

Topic: Fractions (Proportions) Class: P.7 Level: C & C

Days in the months worked for

March – 31 days
April – 30 days
May – 31 days
June – 30 days
Total – 122 days

Builders to work for 4 months

8 months require 5 builders
1 months requires (8 x 5) builders
= 40 builders
4 months require $\frac{40}{4}$ builders
= 10 builders

Payment per day

1 builder – sh.20,000
10 builders – sh20,000 x 10
= sh.200,000

Payment for the 4 months

1 day – sh.200,000
122 days – sh.200,000 x 122
= sh.24,400,000

(b) How many less builders are needed to build the same classroom work in 10 months? (03 Marks)

8 months require 5 builders
1 months requires (8 x 5) builders
= 40 builders
10 months require $\frac{40}{10}$ builders
= 4 builders

Less builders

5 – 4
= 1 builder

29. (a) Find the Highest Common Factor (HCF) of 8 and 12. (02 Marks)

Topic: Operations on Whole Numbers Class: P.6 Level: K & C

2	8	12
2	4	6
	2	3

GCF = 2 x 2
= 4 .

OR: Using factor method

F_8 = {1, 2, (4), 8}
F_{12} = {1, 2, 3, (4), 6, 12}
GCF = 4 .

(b) The sum of three consecutive odd numbers is 88. What is the range of the numbers? (04 Marks)

Let the 1st number be n

1st no	2nd no	3rd no	sum
n	n+2	n+4	15

$n+n+2+n+4 = 87$

$n+n+n+2+4 = 87$

$3n+6 = 87$

$3n+6-6 = 87-6$

$3n = 81$

$\frac{3n}{3} = \frac{81^{27}}{3_{1}}$

$n = 27$

1st no	3rd no	2nd no
n	n+2	n+4
3	3+2	3+4
	5	7

The numbers are;

3, 5, 7

Their range

H – L

7 – 3

= 4

30. The table below shows the number of mangoes picked by some boys in a week. Use the information to answer the question below.

Mangoes	40	m	60	70
No. of boys	||	𝍸 |	|||	|||

If the mean number of mangoes picked that week was 55, Find the value of m. (04 Marks)

Topic: Data Handling Class: P.7 Level: C

METHOD I: Sum of data = Product of mean & No.

Number of data

2 + 6 + 3 + 3 = 14 boys

Product of mean & No.

55 x 14 = 770

Sum of data = Product.

$(40x2) + (mx6) + (60x3) + (70x3) = 770$

$80 + 6m + 180 + 210 = 770$

$470 - 6m = 770$

$470 - 470 + 6m = 770 - 470$

$6m = 300$

$\frac{6^{1}m}{6_{1}} = \frac{300^{50}}{6_{1}}$

$m = 50$

METHOD II: $\frac{\text{Sum of data}}{\text{Number of data}}$ **. = Mean**

$$\frac{(40x2) + (mx6) + (60x3) + (70x3)}{2 + 6 + 3 + 3} = 55$$

$$\frac{80 + 6m + 180 + 210}{14} = 55$$

$$\frac{470 - 6m}{14} = 55$$

$$\cancel{14}^{1} \times \frac{470 - 6m}{\cancel{14}_{1}} = 55 \times 14$$

$$470 - 6m = 770$$

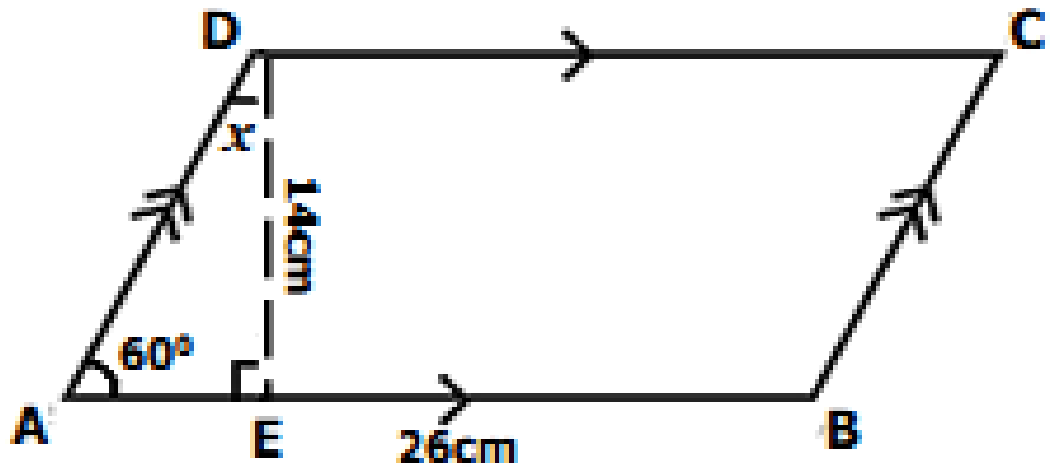
$$470 - 470 + 6m = 770$$

$$6m = 300$$

$$\frac{\cancel{6}^{1}m}{\cancel{6}_{1}} = \frac{\cancel{300}^{50}}{\cancel{6}_{1}}$$

$$m = 50$$

31. In the figure below, **ABCD** is a parallelogram and **AED** is a right angled triangle. Where **AB**=26cm and angle **DAE**= 60^0.



Topic: Lines, Angles and Geometric figures Class: P.6 Level: C & C

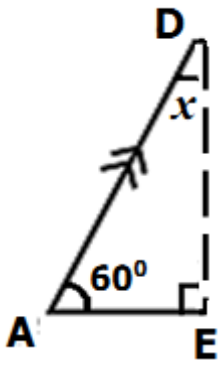
(a) Calculate the area of figure **ABCD**. (02 Marks)

Area = Base x Height

= 26cm x 14cm

= $364cm^2$.

(b) Work out the size of angle x in degrees. (02 Marks)



Interior angles of a triangle add up to 180^0

$60^0 + 90^0 + x = 180^0$

$150^0 + x = 180^0$

$150^0 - 150^0 + x = 180^0 - 150^0$

$x = 30^0$

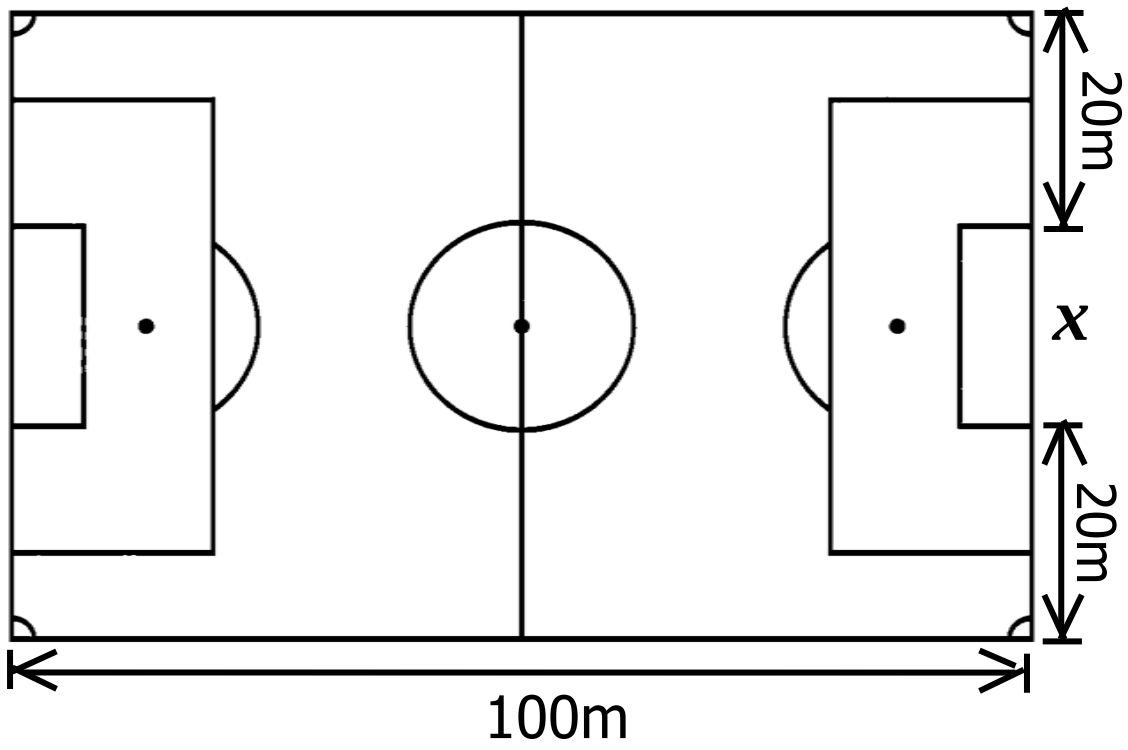
OR:

$x = 180^0 - (90^0 + 60^0)$

$x = 180^0 - (150^0)$

$x = 30^0$

32. Below is a rectangular football pitch of length 100m and a width which is three quarters the length. Use it to answer the questions that follow.



Topic: Length, Mass and Capacity Class: P.6 Level: C & A

(a) Find the area of the above field. (03 Marks)

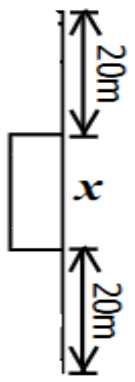
Length = 100m
Width = three quarters the length

$= \frac{3}{4_1} \times \frac{\cancel{100}^{25}}{}$

= 3 x 25m
= 75m

Area = Length x Width
= 100m x 75m
= 7500m^2 .

(b) If the width between the goal posts marked x is equal to the diameter of the circle in middle of the pitch, calculate the circumference of the that circle. (Use $\pi = \frac{22}{7}$) (03 Marks)

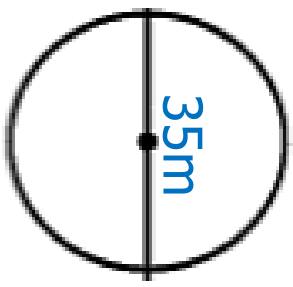


Total width = 75m

The value of x

x = 75m – (20m + 20m)
x = 75m – (40m)
x = 35m

x = Diameter of the circle



Circumference = π D

$= \frac{22}{\cancel{7}_1} \times \frac{\cancel{35}^{5}\text{m}}{}$

= 22 x 5m
= 110m .