

# 1 Basis of arithmetic

## Section A

**2012-1.** Simplify  $\frac{(-7)+5(-4)}{-3}$  (3 marks)

**2012-11.** a. Subtract  $32_6$  from  $278_{10}$ , giving your answer in base 10. (3 marks)

**2010-10.** a. Convert  $9_{10}$  to base 2. (3 marks)

**2009-3.** Simplify  $2110_3 - 2202_3 + 1021_3$ , leaving your answer in base 3. (3 marks)

**2008-1.** Simplify  $\frac{(-5)(-3)+6}{(-7)}$  (3 marks)

**2008-6.** Convert  $1201_3$  to base 10. (4 marks)

**2007-2.** Simplify  $8(-5) + 2(3) - 5$ . (3 marks)

**2006-1.** Simplify  $(-10)(2) \div (-4)$ . (3 marks)

**2006-4.** Convert  $1024_{10}$  to base 8. (3 marks)

**2005-3.** Convert  $321_{12}$  to base 10. (4 marks)

**2004-5.** a. Evaluate  $112_3 + 102_3$  leaving your answer in base 3. (3 marks)

**2003-1.** Subtract -5 from -4. (3 marks)

**2003-3.** Convert  $1264_7$  to base 10. (4 marks)

## Section B

**2011-16.** b. Convert 1405 to base 10. (3 marks)

## 2 Indices and logarithms

### Section A

**2012-13.**

a. Simplify  $m^0 + 49^{\frac{1}{2}}$  (3 marks)

**2012-14.**

b. Use logarithms to evaluate  $\sqrt{47.89}$ , leaving your answer correct to 2 decimal places. (5 marks)

**2011-3.**

Simplify  $(3k)^2 - (4k^4)^{\frac{1}{2}}$  (4 marks)

**2011-14.**

b. Evaluate  $\frac{1391.0}{17.7}$  using logarithms leaving your answer correct to 2 significant figures. (4 marks)

**2010-11.**

Simplify  $3^3 e^4 \div 3e^{-4}$ . (3 marks)

**2009-9.**

Use logarithms to evaluate  $(51 \cdot 8)^{\frac{1}{3}}$  giving your answer correct to one decimal place. (4 marks)

**2009-10.**

a. Simplify  $\frac{(p^2 q^2)^{\frac{1}{2}}}{q} \cdot (3 \text{ marks})$

**2008-2.**

Simplify  $y(y^{-2})^5$ . (3 marks)

**2008-13.**

Use logarithms to evaluate  $(4.56)^3$  and give your answer to 3 significant figures. (4 marks)

**2007-8.**

Evaluate  $\sqrt{667.9}$  and give your answer correct to 3 decimal places. (3 marks)

**2007-9.**

Simplify  $2m(3m)^2$ . (4 marks)

**2006-11.**

Evaluate  $(4 \cdot 13)^2$  and give your answer correct to 3 significant figures. (3 marks)

**2005-2.**

Evaluate  $64^{\frac{1}{3}} + 2^2$ . (4 marks)

**2003-12.**

Evaluate  $\frac{41.67^2}{161}$  using logarithms. (5 marks)

## **Section B**

**2010-18.**

b. Use logarithms to evaluate  $2 \cdot 7 \times 40 \cdot 3$ , leaving your answer correct to two significant figures. (4 marks)

**2007-16.**

Use logarithm tables to evaluate  $\frac{36.7}{\sqrt{2.8}}$  (6 marks)

**2005-17.**

Simplify  $a^2 \times a^{-4} \div a$ . (3 marks)

**2005-19.**

b. Evaluate  $\sqrt{12.5}$  and give your answer correct to 2 decimal places. (3 marks)

**2004-17.**

Use logarithms to evaluate  $\frac{123 \times 27.3}{2.631}$  (6 marks)

### 3 Social and commercial arithmetic

#### Section A

**2012-6.** A lady bought a shirt marked K400.00 with 15% surtax and two pairs of socks at K120.00 per pair surtax free. Calculate the total amount of money she paid. (6 marks)

**2010-4.** The value of a bicycle depreciated by 7% in the first year. At the beginning of the second year the value of the bicycle was K9300. Calculate the original value of the bicycle. (4 marks)

**2009-5.** A customer uses 192 units of electricity in a month. If the electricity supply company has a fixed charge of K350.00 per month and K14.50 per unit of electricity, calculate the electricity bill for the customer. (4 marks)

**2008-7.** Mr. Dzuwa works as an accountant and earns K 60 000 per month. He is allowed K 17 500 tax free per month. If he pays 15 % income tax on the rest, calculate the total income tax he pays in a year. (5 marks)

**2006-12. b.** The surtax for a product at a market is 5%. If the cost of the product including the surtax is K441.00, calculate the original price of the product. (4 marks)

**2005-10.** A school bought a car at K540,000. The value of the car depreciated by 5% after one year. Calculate the value of the car at the beginning of the second year. (4 marks)

**2004-8.** The table below shows rate of income tax an employee pays at a company.

INCOME PER MONTH	RATE OF TAX
First K4,800	0%
Next K9,600	10%
In excess of K14,400	25%

Calculate the income tax payable by a person who K24 400 per month. (6 marks)

#### Section B

**2011-16. a.** An agent got a commission of K2000 on sales of policies. If the rate of commission is 20%, calculate the amount of policies sold. (3 marks)

**2007-17. b.** A lady is given 10% commission for every newspaper she sells. If she sold 1000 newspapers at K60 each, calculate her commission. (3 marks)

**2003-19. b.** A vendor reduced the price of a pocket radio from K800 to K720. Calculate the discount percentage. (2 marks)



# 4 Number patterns

## Section A

**2012-15.**

b. The terms -8, P, 12, 22 are in a sequence. Calculate the value of P. (3 marks)

**2010-12.**

Given the sequence, 7, 11, 15, 19, 23, ... 283. Find the number of terms in the sequence. (5 marks)

**2009-6.**

**Table 1** shows the positions of terms, the term and the connection between the position and the term in a sequence.

**Table 1**

POSITION	TERM	CONNECTION BETWEEN POSITION AND TERM
1	3	$1 + (1 + 1)$
2	5	$2 + (2 + 1)$
3	7	$3 + (3 + 1)$

Write down the  $n^{\text{th}}$  term in its simplest form. (3 marks)

**2008-10.**

The terms  $-7, b, 17$  are in arithmetic sequence. Calculate the value of  $b$ . (4 marks)

**2007-13.**

The  $n^{\text{th}}$  term of a sequence is  $2n - 1$ . If the last term is 11, calculate the number of terms of the sequence. (4 marks)

**2007-15.**

b. Copy and complete the pattern of numbers in the **table below**.

NUMBER	PATTERN	TOTAL
1	1	1
2	1+2+1	4
3	1+2+3+2+1	9
4	1+2+3+4+3+2+1	16
5		

(3 marks)

**2006-2.**

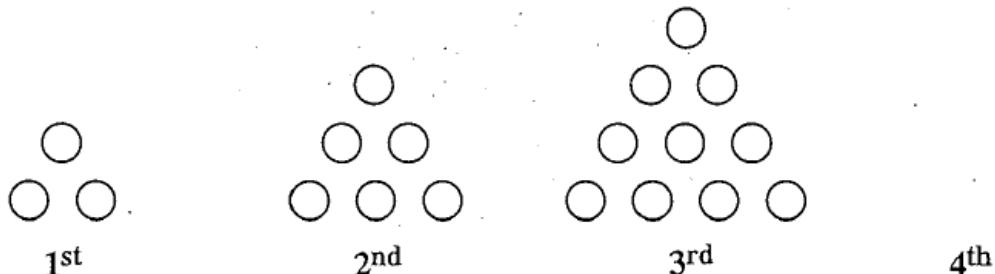
The  $n^{\text{th}}$  term of a sequence is  $n^2+n$ . Calculate the 5<sup>th</sup> term of the sequence. (3 marks)

**2004-5.**

b. Find the next term in the sequence  $1^2, 3^2, 5^2, 7^2, \dots$  (1 mark)

**2003-2.**

a. study **Figure 1** which shows triangular pattern of dots.



**Figure 1**

By drawing the 4<sup>th</sup> triangular pattern, find the number of dots which form it. (2 marks)

## **Section B**

**2011-19.**

a. The  $n^{\text{th}}$  term of a sequence is  $3n - 2$ . Write down:

- (i) the first three terms of the sequence. (3 marks)
- (ii) the rule used to generate the sequence. (1 mark)

# 5 Density and mixture

## Section A

**2012-11.**

b. A cylinder of internal diameter 14 cm and height 10 cm is filled with a fluid of mass 3080g. Calculate the density of the fluid. (Take  $\pi = \frac{22}{7}$ ). (4 marks)

**2011-7.**

A bottle weighs 77 g when empty, 101 g when full of water and 107 g when full of glycerine. Find the relative density of glycerine. (4 marks)

**2010-13.**

A rectangular tank of volume  $1800\text{cm}^3$  is filled with fuel. Given that the density of fuel is  $0.7\text{g/cm}^3$ , calculate the mass of fuel in the tank. (3 marks)

**2008-4.**

A mathematical instrument box has a mass of 273 g.

If its relative density is 2.1, calculate the volume of the mathematical instrument box. (4 marks)

**2007-10.**

2 kg of white sugar costing K200 was mixed with 3 kg of brown sugar costing K270.

Calculate the cost of the mixture per kg. (4 marks)

**2005-13.**

A bottle weighs 20 g when empty, 55 g when full of petrol and 70 g when full of water.

Calculate the relative density of petrol. (4 marks)

**2003-15.**

A container Weighs 105 g when empty, 645 g When full of water and 915 g When full of liquid H.

Calculate the density of liquid H. (5 marks)

## Section B

**2011-17.**

b. The Volume of a cylinder is  $385\text{ cm}^3$ . Given that its diameter is 7 cm, calculate the height of the cylinder. (Take  $\pi = \frac{22}{7}$ ). (3 marks)

**2010-19.**

b. In what ratio must white beans costing K146 per kg be mixed with red beans costing K170 per kg in order for the mixture to cost K152 per kg? (4 marks)

# 6 Proportions

## Section A

**2011-10.**

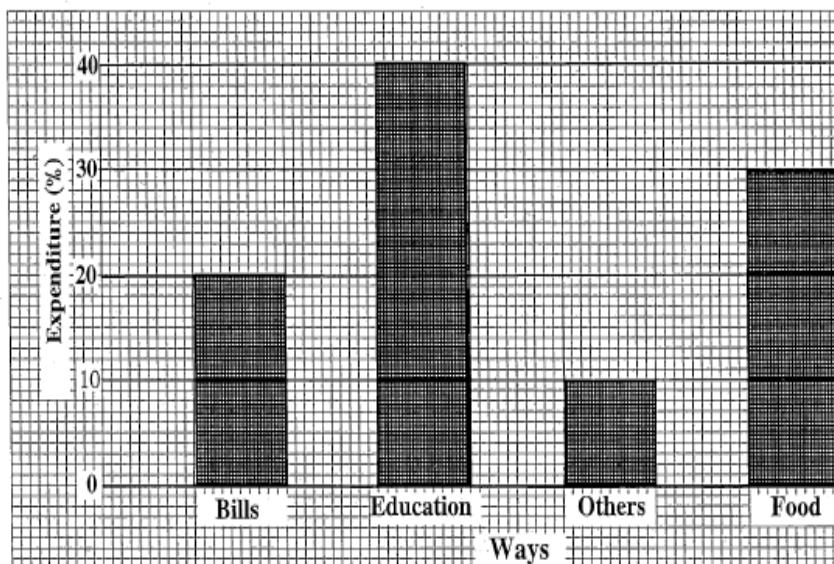
- a. A family of four members has enough food for 30 days. If 2 visitors join them, how long would the food last? (3 marks)

**2009-10.**

- b. In a discount shop the price of an item was reduced from K700 to K616. Calculate the discount percentage. (2 marks)

**2008-14.**

**Figure 2** is a bar graph showing ways in which a person spends his/her monthly salary.



**Figure 2**

If the person's monthly salary is K38000, calculate the monthly expenditure on food. (4 marks)

**2007-11.**

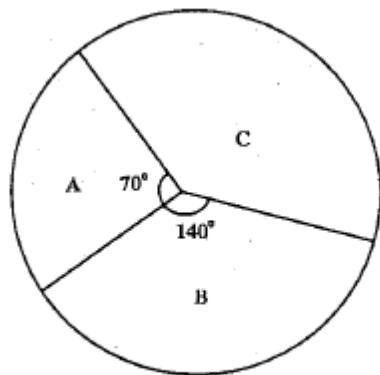
At a school 60% of the pupils are girls. If there are 48 girls, calculate the total number of pupils at the school. (5 marks)

**2006-6.**

A drum can hold 25 l of water. Calculate the number of bottles which can be used to fill the drum if each bottle can contain 500 ml of Water. (3 marks)

**2005-6.** A family of 6 people uses 30 kg of flour in a month. If two visitors joined them for a month, how many kilograms of flour would be required for that month? (3 marks)

**2004-7.** Figure 1 is a pie chart showing proportions of votes for candidates A, B and C.



**Figure 1**

Calculate the percentage of the votes that were for candidate C. (5 marks)

**Section B**

**2005-18.**

a. Chimwemwe and Chikondi share K540 so that Chikondi has K80 more than Chimwemwe. Find their shares. (6 marks)

# 7 Probability

## Section A

**2012-8.**

a. A die has its six faces marked 0, 1, 1, 1, 6, 6.

If it 1 is thrown once, find the probability that it will show a 6. (2 marks)

**2011-14.**

a. The letters of a word **ABSTINENCE** are written on identical pieces of paper and then put in a bag.

If one piece of paper is picked at random, find the probability that it has a letter **N**. (3 marks)

**2010-6.**

A learner has 6 red counters and 9 blue counters in a pocket.

If one counter is picked at random, find the probability that it is a blue counter. (3 marks)

**2009-7.**

A box contains 20 white beans, 30 black beans and 10 red beans.

Calculate the probability of picking a white bean. (3 marks)

**2007-6.**

Find the probability of choosing the letter **A** from the Word **NYALA**. (3 marks)

**2003-5.**

b. In order to decide which team begins playing football, a referee tosses a coin once.

If team A chooses head, what is the probability that team B begins playing? (2 marks)

# 8 Statistics

## Section A

**2010-5.**

The **table below** shows marks for 5 students **A, B, C, D** and **E** in a test.

Students	A	B	C	D	E
Marks	7	11	6	7	9

Find the mean mark. (3 marks)

**2009-2.**

The mean mass of 3 packets of sugar is 400 g. If the mass of 2 packets is 900 g, calculate the mass of the third packet. (3 marks)

**2006-5.**

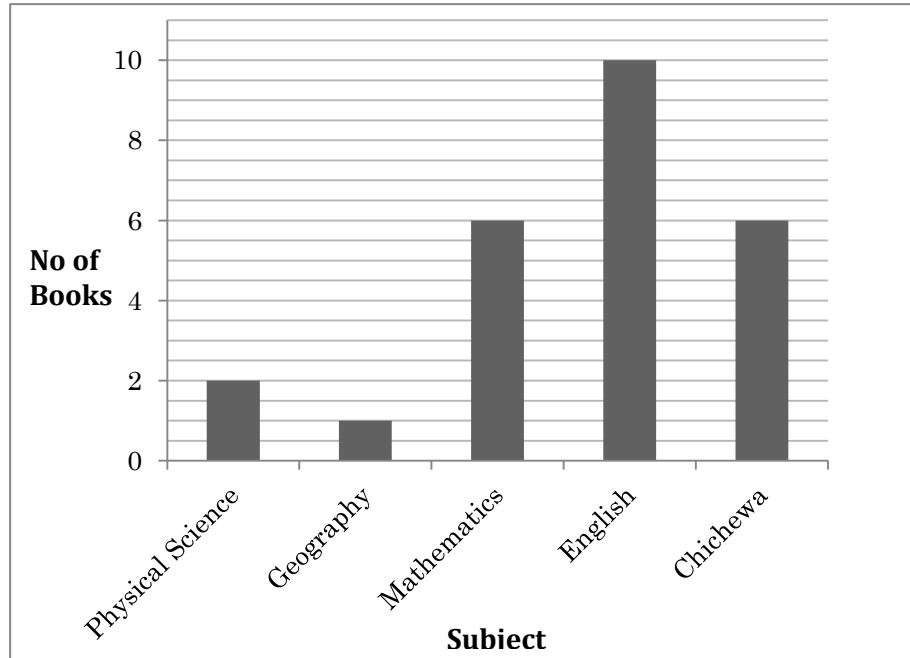
a. Given the following list of numbers:

4, 1, 4, 2, 3, 7, 4, 3.

Calculate the median. (3 marks)

**2005-4.**

b. **Figure 1** is a bar graph showing the number of textbooks according to subjects in a certain classroom.



**Figure 1**

Calculate the total number of books in the classroom. (3 marks)

## **Section B**

**2012-17.**

**Table 1** shows the number of pupils and the months they were born.

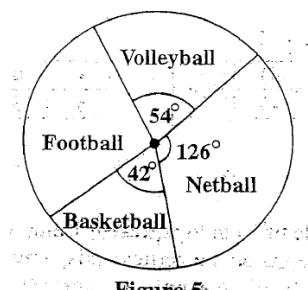
**Table 1**

Month of Birth	May	June	July	August
Number of Pupils	5	6	9	4

Using a scale of 2 cm to represent 2 units on the vertical axis, draw a bar chart to represent the information. (3 marks)

**2011-17.**

a. **Figure 5** is a pie chart of students who play different games.



If the total number of students is 60, calculate the number of students who play football. (5 marks)

**2008-19.**

a. The ages of five people are 15, 20, 12, 10 and K. If their mean age is 14, calculate the age represented by K. (3 marks)

**2007-18.**

a. The following are marks of 15 students:

6	8	7	6	9
9	6	8	7	10
7	7	9	9	9

Draw a bar chart on the graph paper provided to represent this information. (5 marks)

# 9 Algebraic expressions

## Section A

**2012-3.** Given that  $e = 4, f = -2$  and  $g = -5$ , find the value of  $2e - f + g$ . (3 marks)

**2012-5.** Find the LCM of  $30ef, 10e^2f$  and  $5f^2$ . (3 marks)

**2012-14.** a. Make  $r$  the subject of the formula  $L = ra + n$  (3 marks)

**2011-1.** Simplify  $2k - 7f - 4(2k - 3f)$ . (3 marks)

**2011-5.** Find the HCF of  $4ar^2, 6a^2br$  and  $8ac^2r$ . (3 marks)

**2010-1.** Given that  $a = -2$ , and  $b = 5$ , find the value of  $a^2 - b$ . (3 marks)

**2010-7.** a. Simplify  $\frac{2c-4}{c^2-4}$ . (3 marks)

**2009-1.** Given that  $p = -1, t = -2$  and  $r = 4$ , find the value of  $\frac{2pr}{t}$ . (3 marks)

**2009-4.** b. Make  $g$  the subject of the formula  $h = k - (g + e)$ . (3 marks)

**2009-14.** a. Simplify  $x + 3y - (-x) - 4y$ . (2 marks)

**2008-9.** Factorise completely  $xk - xm - kz + mz$ . (4 marks)

**2008-11.** Simplify  $\left(\frac{4x}{5}\right) \div \left(\frac{4x-4}{5}\right)$ . (4 marks)

**2007-3.** Given that  $x = 2$  and  $y = 4$ , find the value of  $\frac{x+y}{x-y}$ . (3 marks)

**2007-4.** Find the L.C.M. of  $2x, 12xy$  and  $18x^2y$ . (4 marks)

**2006-3.** Factorise  $x^2 + xy$ . (2 marks)

**2005-1.** If  $a = 3$ ,  $b = 4$ ,  $c = -2$ , calculate the value of  $2b - ac$ . (3 marks)

**2005-15.** a. Expand  $-5(2p - 3q)$ . (3 marks)

**2004-2.** Expand  $(3d - 2)^2$  and simplify your answer. (4 marks)

**2004-3.** Find the HCF of  $3^3x^2yz$  and  $3^2xz^3$ . (3 marks)

**2004-4.** Express  $\frac{2}{x} - \frac{3}{x-2}$  as a single fraction in its simplest form. (4 marks)

**2004-11.** Evaluate

$a(b + c)$  when  $a = 4$ ,  $b = -2$  and  $c = -3$ . (3 marks)

**2003-2.** b. Factorise  $4 - X^2$ . (2 marks)

**2003-5.** a. Find the HCF of the following terms:  $4 m^2$ ,  $6 mn^2$  and  $10 mn$ . (3 marks)

**2003-6.** If  $x=-5$ ,  $y=-2$  and  $m=2$ , find the value of  $\frac{3xy^2}{2m}$  (3 marks)

**2003-13.** b. Expand  $(2b + 4)(d - 3bd)$  and give your answer in the simplest form. (3 marks)

# 10 Linear equations

## Section A

**2012-8.**

b. Solve the equation  $\frac{P+1}{5} + P = \frac{3}{5}$  (4 marks)

**2011-2.**

Solve the equation  $\frac{2}{r-1} = 2$ . (4 marks)

**2011-8.**

A farmer has 50 bags of maize. He sells  $(a + 5)$  bags and shares  $(2a - 3)$  bags. If he has 30 bags remaining, form an equation in  $a$  and solve it. (4 marks)

**2009-15.**

The width of a rectangular wire fence is 4 metres shorter than the length. If the total length of the wire used is 36 metres. Calculate the width of the fence. (5 marks)

**2008-12.**

Given an equation  $5x - y = 8$ . Find:

- (i)  $y$ -intercept
- (ii) gradient of the equation (3 marks)

**2005-4.**

a. Solve the equation  $\frac{5m}{3} = m - 2$ . (4 marks)

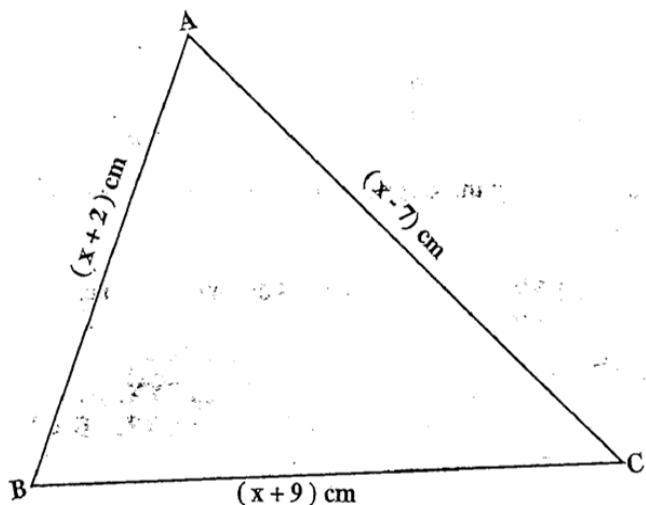
## **Section B**

**2010-20.**

- a. Solve the equation  $\frac{x+2}{3} - \frac{1}{2} = 1$ . (4 marks)

**2007-20.**

- b. **Figure 5** shows a triangle ABC in which  $AB = (x + 2)$  cm,  $BC = (x + 9)$  cm and  $AC = (x - 7)$  cm.



**Figure 5**

If the perimeter of the triangle is 55 cm, calculate the value of  $x$ .

# 11 Inequalities

## Section A

**2012-2.**

Figure 1 shows a number line where a graph of values of  $x$  are indicated.

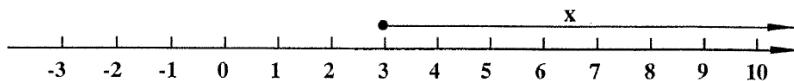


Figure 1

Write down an inequality in  $x$  describing the graph. (3 marks)

**2011-4.**

Solve the inequality  $b + 1 \geq 13 - 3b$ . (3 marks)

**2010-3.**

In a competition, team A scores  $n$  and team B scores  $(n + 5)$  goals. If the total number of goals scored by teams A and B is less than 15, write down an inequality in  $n$  and solve it. (3 marks)

**2009-8.**

Solve the inequality  $4y - 1 > y + 11$ . (3 marks)

**2007-7.**

Solve the inequality  $2x + 10 \leq 4$ . (3 marks)

**2006-5.**

b. A student spent  $(8y + 40)$  kwacha on biscuits and  $2y$  kwacha on sweets. If the total amount of money spent was less than K80, formulate an inequality from this information. (3 marks)

**2005-5.**

Solve the inequality  $4x - 2 > x + 4$ . (4 marks)

**2004-6.**

Solve the inequality  $3 - x < 5$  (4 marks)

**2003-7.**

Solve the inequality  $\frac{m}{2} - \frac{2+m}{3} \leq 0$  (3 marks)

# 12 Linear simultaneous equations

## Section A

**2012-15.**

a. Solve the following simultaneous equations:

$$x + 3y = 11$$

$$5x + 4y = 22 \quad (5 \text{ marks})$$

**2008-15.**

The graphs for  $2x + y = 5$  and  $x + 3y = 5$  intersect at a point R. Without plotting the graphs, calculate the coordinates of point R. (5 marks)

**2004-9.**

Solve the simultaneous equations:

$$y - x = -1$$

$$3x - y = 5 \quad (4 \text{ marks})$$

**2003-14.**

Solve the simultaneous equations:

$$7x + y = 3$$

$$x - 2y = 9 \quad (5 \text{ marks})$$

## Section B

**2010-17.**

Solve the following simultaneous equations:

$$2m - n = 4$$

$$2m - 3n = -4 \quad (5 \text{ marks})$$

**2009-17.**

b. The cost of two bananas and three mangoes is K28, and five bananas and one mango is K31.

Calculate the cost of each banana and each mango. (7 marks)

**2006-18.**

A bag contains 29 coins in which some are 5 tambala coins and others are 2 tambala coins. Let the number of 5 tambala coins be  $x$  and the number of 2 tambala coins be  $y$ .

a. Write down an equation involving  $x$  and  $y$ . (1 mark)

b. If the total amount of money in the bag is 100 tambala, write down another equation involving  $x$  and  $y$ . (3 marks)

c. By solving the equations, find the number of coins of each type of coins. (2 marks)

# 13 Quadratic equations

## Section A

**2012-10.**

A boy is 2 years younger than his sister. The product of their ages is 35. If the age of the boy is  $x$  years, find the value of  $x$ . (6 marks)

**2011-10.**

b. Solve the equation  $k^2 = 10k - 25$  (4 marks)

**2010-14.**

Solve the equation  $t^2 + 7t + 10 = 0$ . (4 marks)

**2009-13.**

Factorise  $2f^2 - 2$  completely. (3 marks)

**2006-14.**

A woman is  $x^2$  years old while her son is  $x$  years old. If the sum of their ages is 42, calculate the age of the woman. (7 marks)

## Section B

**2009-18.**

b. Solve the equation  $y^2 + 4y - 32 = 0$ . (4 marks)

**2007-20.**

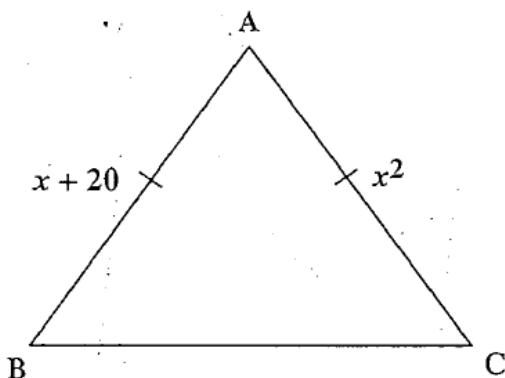
a. Solve the equation  $\frac{4}{9} - 4t^2 = 0$ . (5 marks)

**2006-16.**

Solve the equation  $\frac{2}{m} - \frac{1}{m+2} = \frac{1}{3}$  (8 marks)

**2005-18.**

b. Figure 8 shows an isosceles triangle ABC in which  $AB=AC$ .

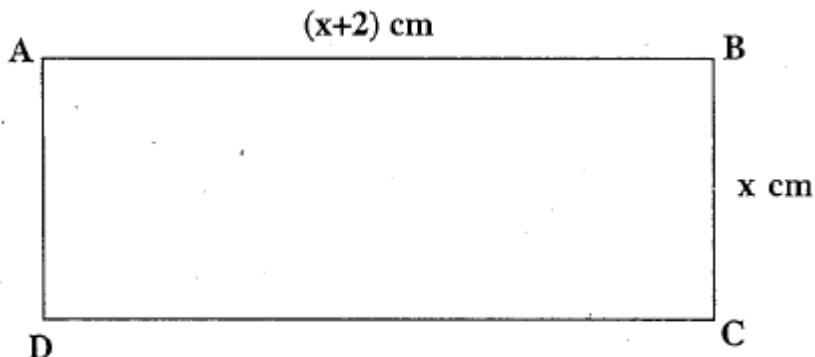


**Figure 8**

If  $AB = (x + 20)$  cm and  $AC = x^2$  cm, calculate the value of  $x$ . (6 marks)

**2004-18.**

Figure 6 shows a rectangle ABCD with  $AB = (x + 2)$  cm and  $BC = x$  cm.



**Figure 6**

If the area of the rectangle is  $63$   $\text{cm}^2$ , calculate the width of the rectangle. (7 marks)

**2003-16.**

Mavuto is, 12 years younger than his sister. The product of their ages is 108. How old is Mavuto? (8 marks)

# 14 Coordinates

## Section A

2006-7.

Figure 1 shows a board used for playing a game.

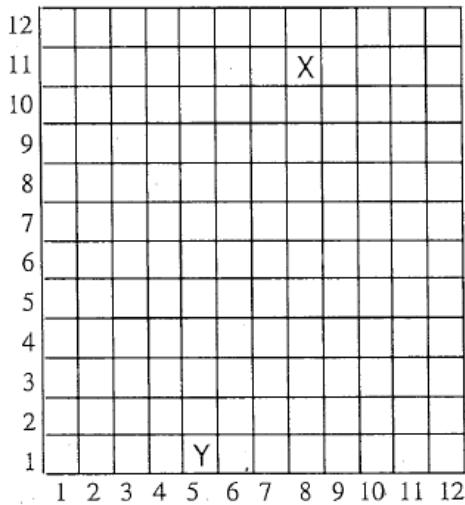


Figure 1

If the position of X is (8,11) find the position of Y. (2 marks)

2004-14.

Figure 3 shows points Q and R on a plane.

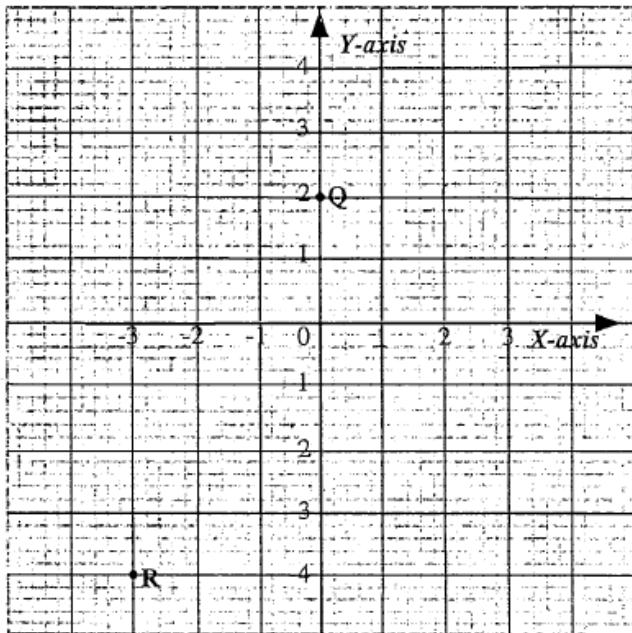


Figure 3

Write down the co-ordinates of the points Q and R. (2 marks)

# 15 Linear graph

## Section A

2012-12.

Figure 4 shows a straight line graph AB.

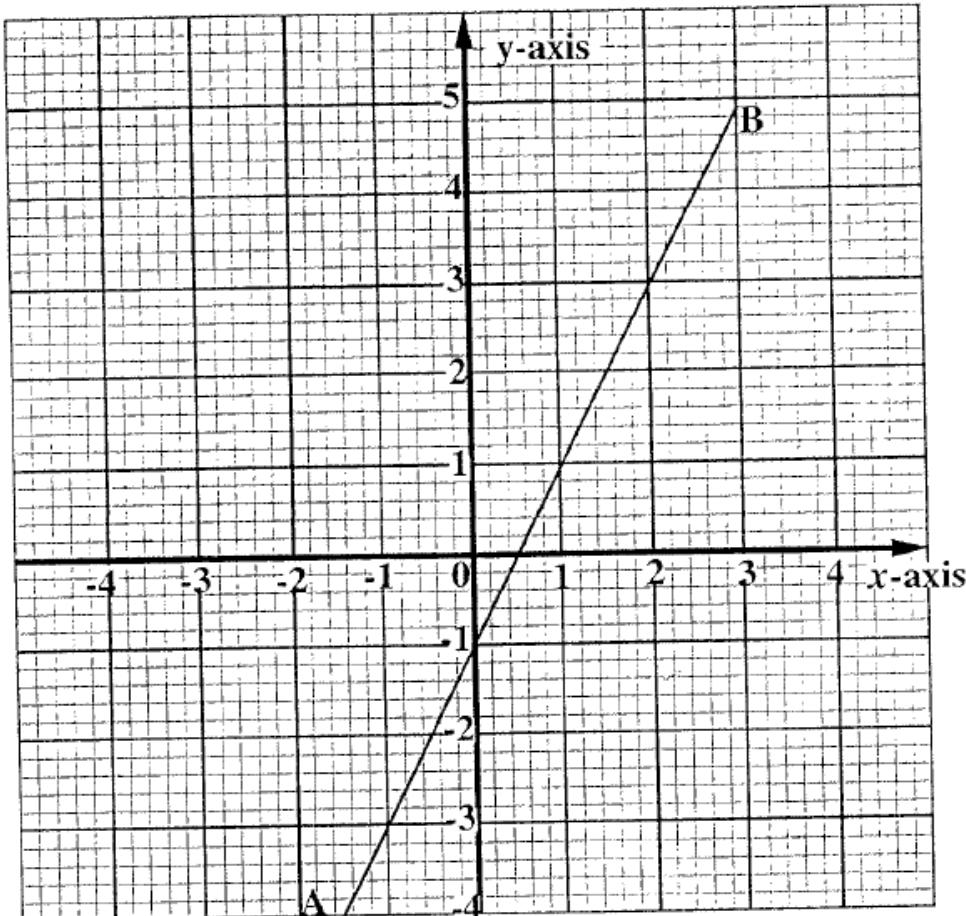


Figure 4

Use the graph to find:

- y coordinate when  $x = -1$  (1 mark)
- the gradient of the line AB. (3 marks)

2010-10.

- The line  $y = mx + c$  has gradient 3 and passes through the point  $(1, 4)$ . Find the value of  $c$ .  
(3 marks)

**2006-12.**

a. Figure 3 shows a graph of a straight line AB which is parallel to the x-axis.

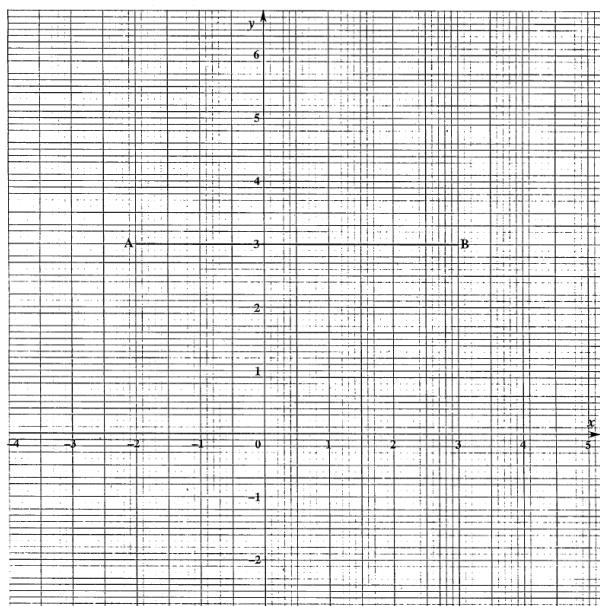


Figure 3

Find the equation of the line AB. (2 marks)

**2005-9.**

Figure 3 is a straight line graph which was drawn using a table of values.

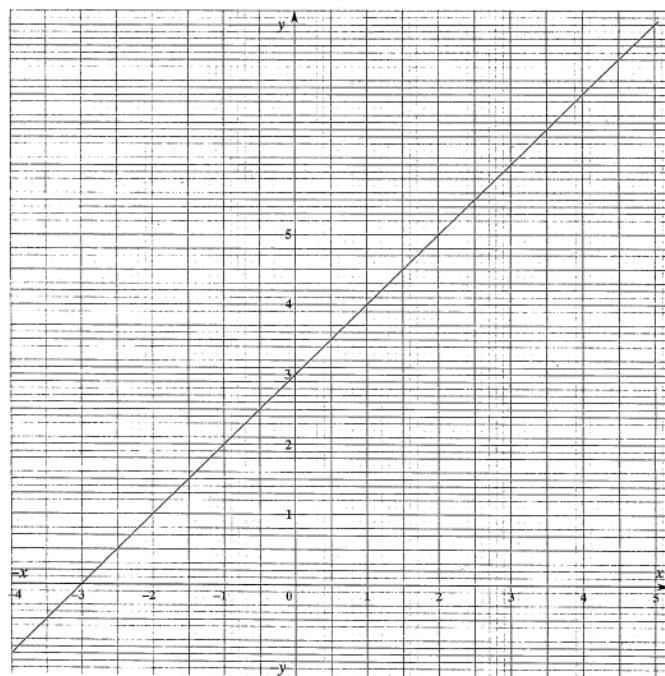


Figure 3

$x$	-3		3
$y$		3	

Using the graph, copy and complete the table of values of  $x$  and  $y$ . (3 marks)

## Section B

**2011-18.**

- a. Complete the table of values for  $y = 5 - 3x$ . (1 mark)

$$y = 2x - 5$$

$x$	-1	0	5
$y$	-7	-5	5

$$y = 5 - 3x$$

$x$	0	2	5
$y$	5		-10

- b. Using a scale of 2 cm to represent 1 unit on the x-axis and 2 cm to represent 2 units on the vertical axis, draw the graphs of  $y = 2x - 5$  and  $y = 5 - 3x$ . (4 marks)

- c. Using the graphs in (b), solve the simultaneous equations

$$y = 5 - 3x$$

$$y = 2x - 5 \quad (4 \text{ marks})$$

**2009-16.**

**Table 2** shows the values of  $x$  and  $y$  for the equation  $y = 2x - 3$ .

Table 1

$x$	0	1	2
$y$		-1	

- a. Copy and complete the table. (2 marks)

- b. Using a scale of 2cm to represent 1 unit on both axes, draw the graph of  $y = 2x - 3$ . (4 marks)

**2005-20.**

- a. Copy and complete the table of values for  $y = 5 - 2x$  and  $y = x - 4$ .

$$y = 5 - 2x$$

$x$	-1	2	5
$y$	7		-1

$$y = x - 4$$

$x$	-1	2	5
$y$	-5	-2	

- b. Using a scale of 2 cm to represent l unit on the  $x$ -axis and 2 cm to represent 1 unit on the  $y$ -axis, draw on the same axes, the graphs of  $y = 5 - 2x$  and  $y = x - 4$ . (6 marks)

- c. Use the graph to solve the simultaneous equations:  $y = 5 - 2x$  and  $y = x - 4$ . (2 marks)

# 16 Travel graph

## Section A

**2012-4.**

A minibus uses 10 litres of fuel in 70km. Calculate the distance it would cover with 7 litres of fuel.

(3 marks)

## Section B

**2010-16.**

A cyclist left point **A** at 6:30 am for point **C**, which is 20 km away. At 7:00 am he stopped at point **B** for  $1\frac{1}{2}$  hours having covered a distance of 12 km. He then continued at a speed of 16 km/h.

a. Using a scale of 2 cm to represent 4 km on the vertical axis and 2 cm to represent 30 minutes on the horizontal axis, draw the distance-time graph for the cyclist. (5 marks)

b. Using your graph, find the time taken for the cyclist to reach his destination. (3 marks)

**2008-20.**

A minibus left city **H** for city **Z**, 200 km away, at 12:00 noon at a speed of 50 km/h. After traveling for 2 hours, there was a breakdown which took 1 hour to be repaired. The journey then continued at a constant speed arriving at city **Z** at 17:30 hours.

a. Using a scale of 2 cm to present 1 hour on the horizontal axis and 2 cm to represent 25 km on the vertical axis, draw a distance-time graph of the minibus. (5 marks)

b. How far from city **H** is the minibus at 16:54 hours. (1 mark)

c. Calculate the speed of the minibus after the breakdown. (4 marks)

### 2007-17.

a. **Figure 3** shows a graph **ABCD** of Mr Phiri's journey,

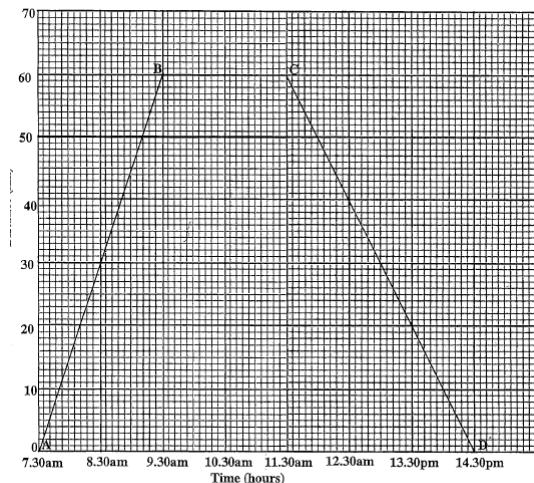


Figure 3

(i) How far is **B** from **A**? (1 mark)

(ii) Calculate the average speed of Mr Phiri's journey from **C** to **D**. (3 marks)

### 2006-20.

Train A leaves station P at 6.00 am and travels at a Constant speed of 20 km per hour to station Q which is 250 km away. Train B leaves station Q at 11.30 am for station P at a constant speed of 50 km/hr.

- a. Using a scale of 1 cm to represent 1 hour on the horizontal axis and 2 cm to represent 50 km on the vertical axis, draw the graphs on the same axes to show the journeys of the two trains. (8 marks)
- b. At what time will the two trains meet? (2 marks)

### 2004-19.

a. **Figure 7** shows a graph of a car travelling from Lilongwe to Blantyre. The car stopped in Dedza for some time.

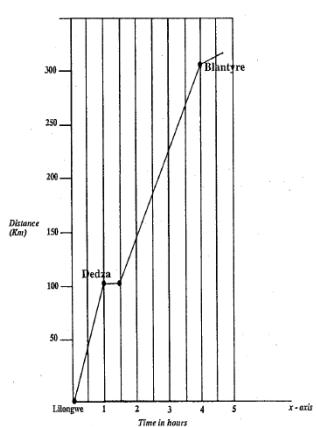


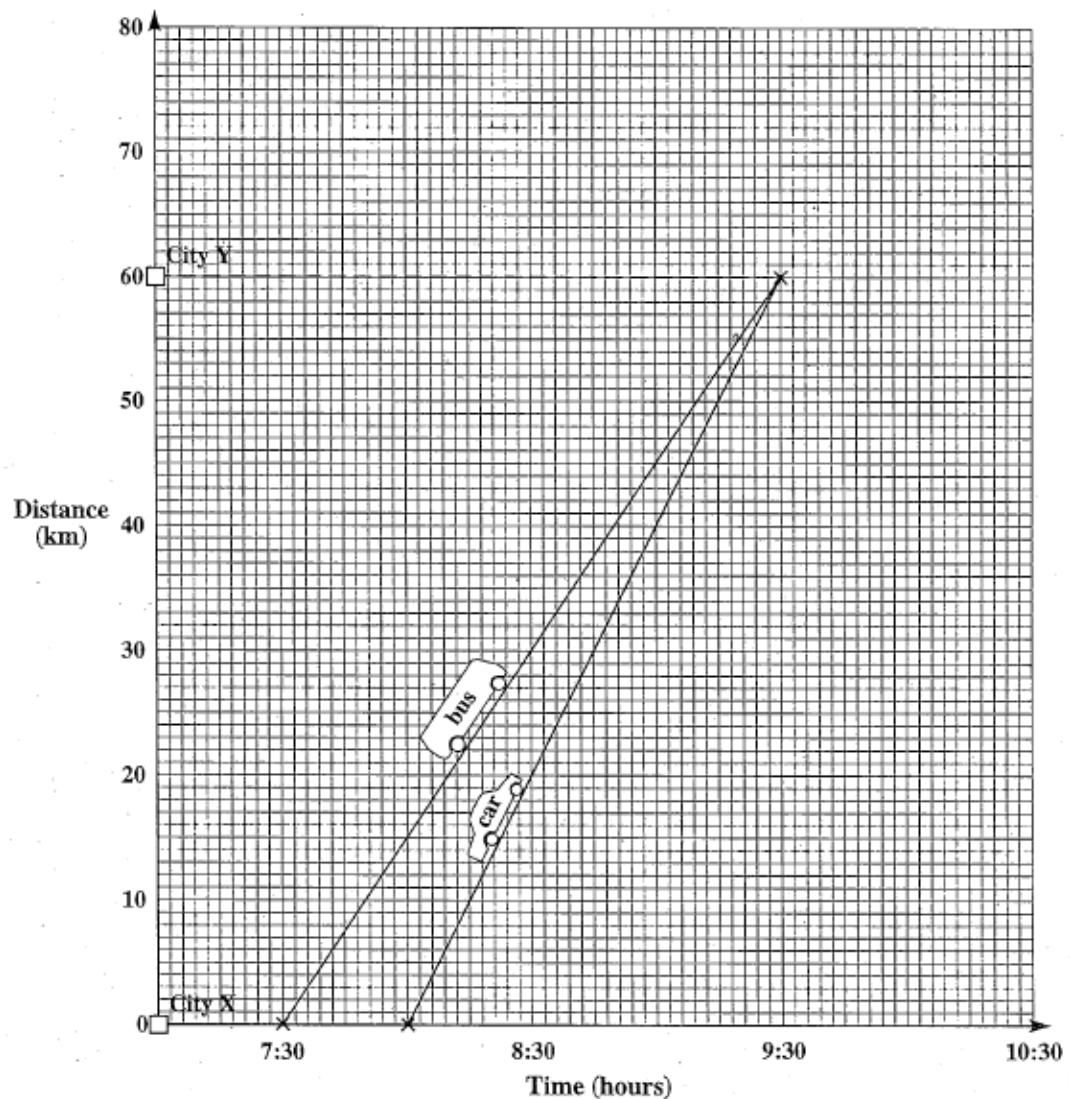
Figure 7

(i) What distance did the car travel? (1 mark)

(ii) For how much time was the car in motion? (4 marks)

**2003-20.**

**Figure 8** shows graphs of a car and a bus travelling between two cities X and Y.



**Figure 8**

Using the graphs, calculate the difference between the speed of the car and the speed of the bus.

(8 marks)

# 17 Sets

## Section A

**2011-11.**

Given that

$$\xi = \{\text{fanta, coke, sprite, cherry plum, cocopina}\}$$

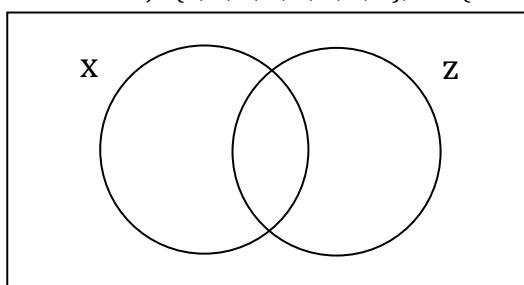
$$A = \{\text{fanta, sprite}\} \text{ and } B = \{\text{cocopina, cherry plum}\}$$

a. Present the information using a venn diagram. (4 marks)

b. Find and state  $A \cap B$ . (1 mark)

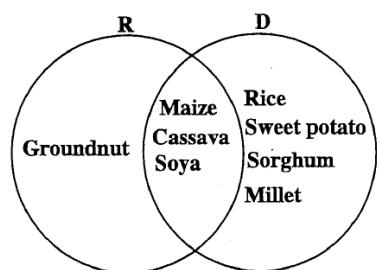
**2010-9.**

Given that  $\xi = \{2, 3, 4, 5, 6, 7, 8, 9\}$ ,  $X = \{\text{Prime numbers}\}$  and  $Z = \{\text{Odd numbers}\}$



Using the given sets, copy the Venn diagram and fill in the elements. (5 marks)

**2009-4. a. Figure 1** shows a venn diagram containing crops grown on farms **R** and **D**.



**Figure 1**

(i) Find the number of crops grown on farm **D**.

(ii) Write down crops grown on both farms. (3 marks)

**2008-3.** Given that M and N are sets containing fruits where

$$M = \{\text{tomato, pumpkin, mango, paw-paw, peach}\}$$

$$N = \{\text{guava, tomato, banana, mango, paw-paw}\}$$

Draw a venn diagram to present this information. (4 marks)

**2007-5.** Given Set A = {2,3,4,5,6,7} and Set B = {2,4,6,8} Find  $A \cap B$ . (3 marks)

**2006-10.** Given set A = {3, 4}, list any three subsets of the set. (4 marks)

**2005-8.** Given that X and Y are sets containing birds where

set X = {njiwa, pumbwa, kakowa, khwangwala} and

set Y = {nkhunda, timba, kakowa, kabawi, njiwa, kadzidzi}.

How many elements are in the union X and Y? (2 marks)

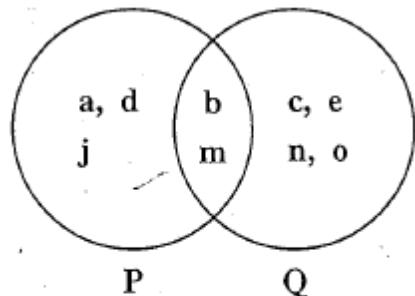
**2004-10.** Given that  $\varepsilon = \{3, 4, 5, 6, 7, 9\}$

A = {4, 6, 8}

B = {3, 6, 9}

Draw venn diagram to represent this information. (4 marks)

**2003-13. a.** Figure 5 shows a venn diagram illustrating the relationship between sets P and Q.



**Figure 5**

Write down:

(i) all the elements in P.

(ii)  $P \cap Q$  (2 marks)

## **Section B**

**2012-18.**

b. Given that:

P = {2,4,6,8}

Q = {1,2,3,4,5,6,7}.

List down elements in:

(i)  $P \cap Q$  (2 marks)

(ii)  $P \cup Q$  (2 marks)

# 18 Vectors

## Section A

**2009-11.**

Given that  $\overrightarrow{AB} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$  and  $\overrightarrow{CD} = -3\overrightarrow{AB}$ , find  $\overrightarrow{CD}$ . (3 marks)

**2008-8.**

Given that  $\overrightarrow{PQ} = \begin{pmatrix} 6 \\ 5 \end{pmatrix}$ ,  $\overrightarrow{PR} = \begin{pmatrix} x \\ y \end{pmatrix}$  and  $\overrightarrow{RQ} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$ . If  $\overrightarrow{PQ} = \overrightarrow{PR} + \overrightarrow{RQ}$ , find  $\overrightarrow{PR}$ . (4 marks)

**2006-9.**

If  $A=(2,3)$  and  $B=(5,-2)$ , find

- (i)  $\overrightarrow{AB}$
- (ii)  $\overrightarrow{BA}$ , hence show that  $\overrightarrow{AB} - \overrightarrow{BA} = 2\overrightarrow{AB}$  (8 marks)

**2005-7.**

In **Figure 2**, **H** and **K** are points on a vector drawn on a graph paper.

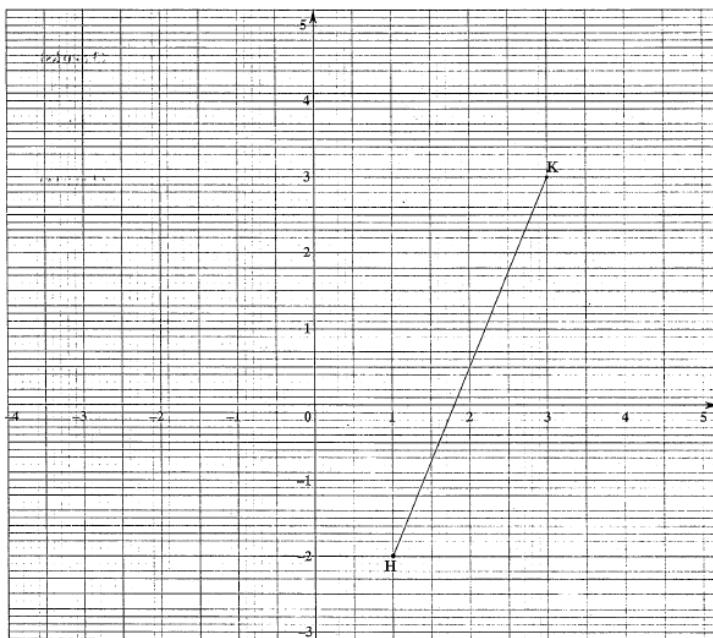


Figure 2

- a. Find points **H** and **K** in column form.
- b. Find the column vector of **HK**. (5 marks)

**2003-9.** Given that vector  $\overrightarrow{AB} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$  and vector  $\overrightarrow{DC} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ , calculate  $\frac{1}{2}(\overrightarrow{AB} + \overrightarrow{DC})$ . (3 marks)

## Section B

2012-18.

- a. Given that  $\underline{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$  and  $\underline{b} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$ , find  $\underline{a} - 3\underline{b}$ . (4 marks)

2011-19.

- b. Given that  $\overrightarrow{CD} = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$  and  $\overrightarrow{EF} = \begin{pmatrix} a \\ 10 \end{pmatrix}$ . If  $2\overrightarrow{CD} = \overrightarrow{EF}$ , find the value of  $a$ . (3 marks)

2010-18.

- a. **Figure 4** shows vectors **KL** and **LM**.

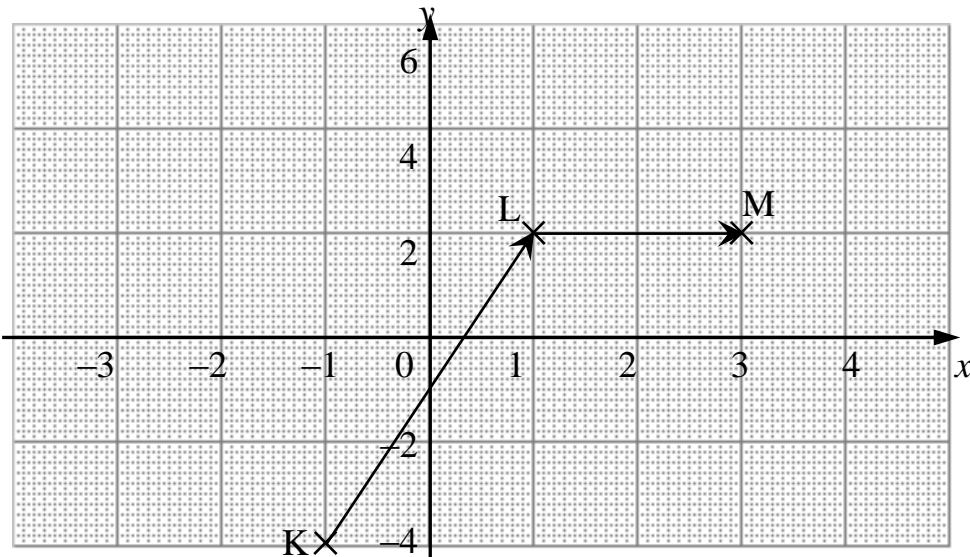


Figure 4

Find  $\overrightarrow{KL} + \overrightarrow{LM}$ . (3 marks)

2007-19.

- b. Vector  $\overrightarrow{AB} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$  and Vector  $\overrightarrow{BC} = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$ . Using a scale of 2 cm to represent 1 unit on both  $x$  and  $y$  axes, draw the vectors  $\overrightarrow{AB}$  and  $\overrightarrow{BC}$  on the same axes. (4 marks)

2004-19.

- b. If  $\vec{a} = \begin{pmatrix} 2 \\ 4 \end{pmatrix}$ ,  $\vec{b} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$  using these vectors, show that  $\vec{a} - \begin{pmatrix} -3 \\ 1 \end{pmatrix} = \vec{b} + \begin{pmatrix} 3 \\ 5 \end{pmatrix}$ . (4 marks)

# 19 Line and angles

## Section A

2012-7.

In Figure 2, **ABC** is parallel to **DEF** and **GH**. Angle **GHB** =  $125^\circ$  and angle **BEF** =  $105^\circ$ .

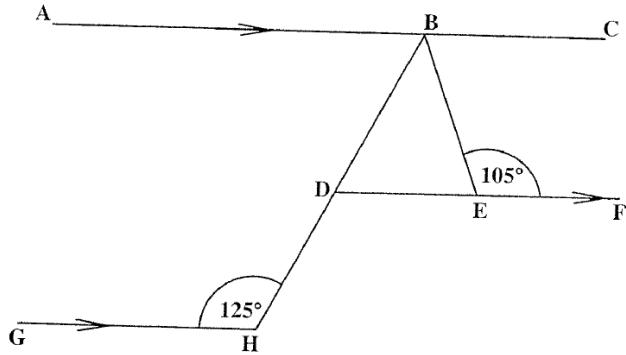


Figure 2

Calculate angle **DBE**. (4 marks)

2010-2.

In Figure 1, straight lines **AMC** and **DMB** intersect at **M**, angle **BMC** =  $130^\circ$  and angle **AMD** =  $5y^\circ$ .

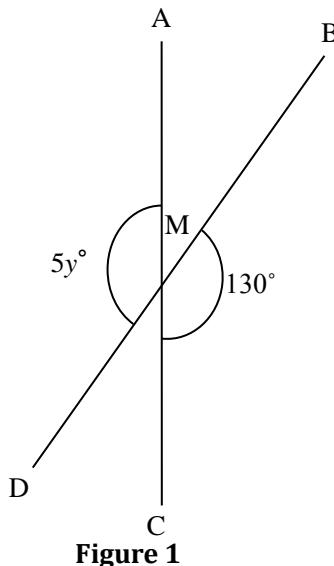


Figure 1

Calculate the value of  $y^\circ$ . (2 marks)

**2008-5.**

In **Figure 1** WX and YZ are parallel lines. Angle **WAB** =  $147^\circ$  and angle **CBZ** =  $62^\circ$ .

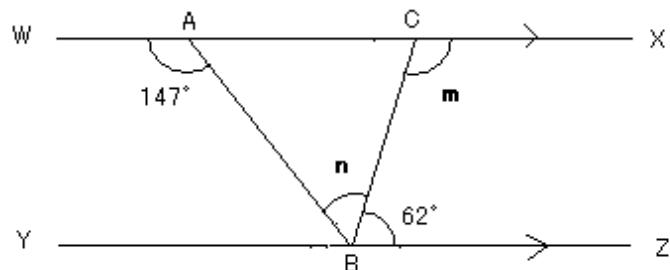


Figure 1

Calculate the values of angles marked **m** and **n**. (5 marks)

**2007-1.**

In **Figure 1**, ABC is a straight line.

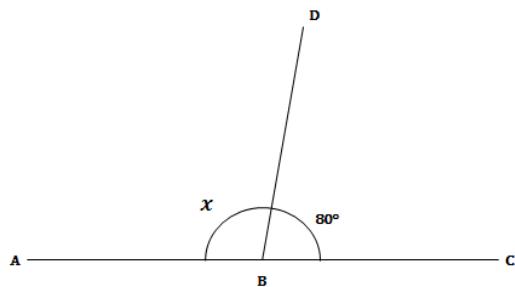


Figure 1

If angle **DBC** =  $80^\circ$ , calculate the value of **x**. (3 marks)

**2006-8.**

In **Figure 2**, AB, CD and EF are parallel to one another. Angle **HIB** =  $140^\circ$  and angle **GEF** =  $110^\circ$ .

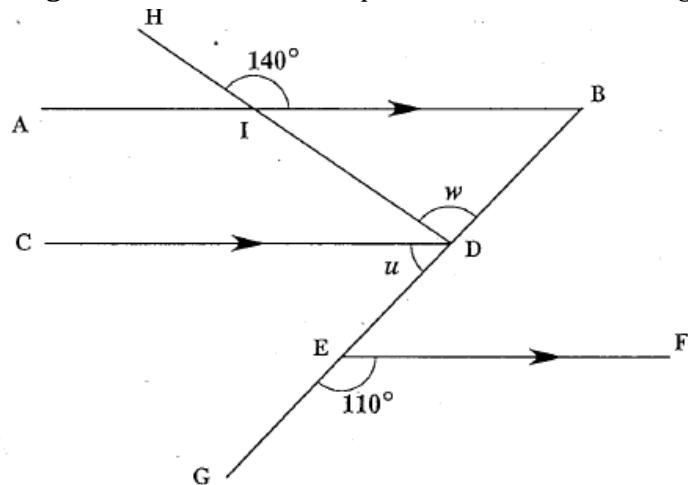
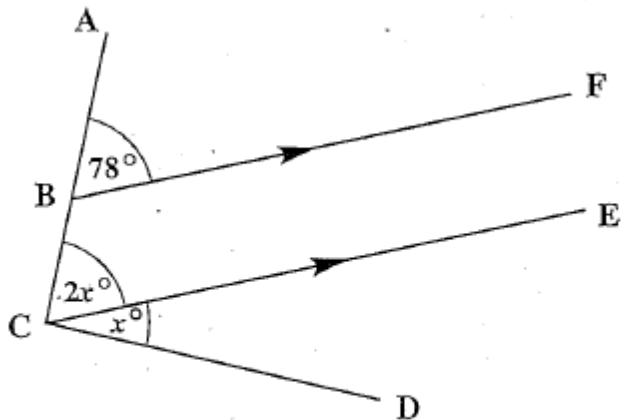


Figure 2

Calculate the angles labelled **u** and **w**. (7 marks)

**2003-8.** In Figure 3, angle ABF =  $78^\circ$ , angle ACE =  $2x^\circ$  angle ECD =  $x^\circ$  and BF is parallel to CE.



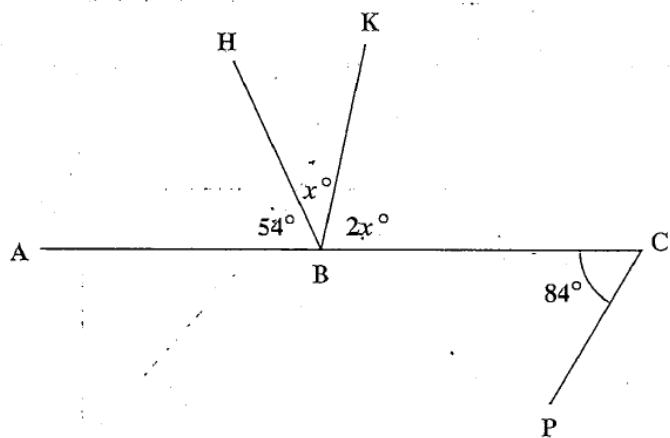
**Figure 3**

Calculate angle ACD. (4 marks)

## Section B

**2005-19.**

a. In Figure 9, ABC is a straight line, angle ABH =  $54^\circ$ , angle HBK =  $x^\circ$ , angle KBC =  $2x^\circ$  and angle BCP =  $84^\circ$ .



**Figure 9**

- (i) Calculate the value of  $x$ .
- (ii) Show that lines BK and PC are parallel. (7 marks)

# 20 Reflection and rotations

## Section A

2010-15.

Figure 3 shows line  $\mathbf{AB}$  with coordinates  $A(2, 4)$  and  $B(4, 6)$  rotated through  $90^\circ$  angle clockwise to line  $\mathbf{A'B'}$  which has coordinates  $A'(8, 2)$  and  $B'(10, 0)$ .

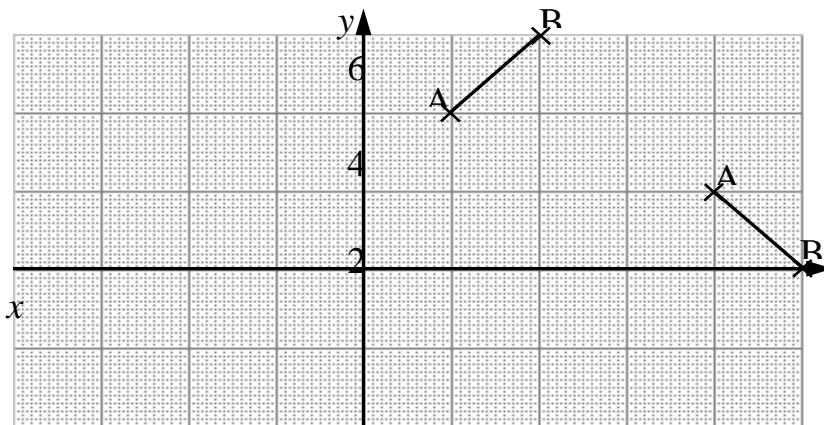


Figure 3

- Copy the figure on the graph paper provided. (2 marks)
- Find the centre of rotation. (2 marks)

2006-13. Figure 4 shows a nail  $AB$  and its image  $A'B'$ .

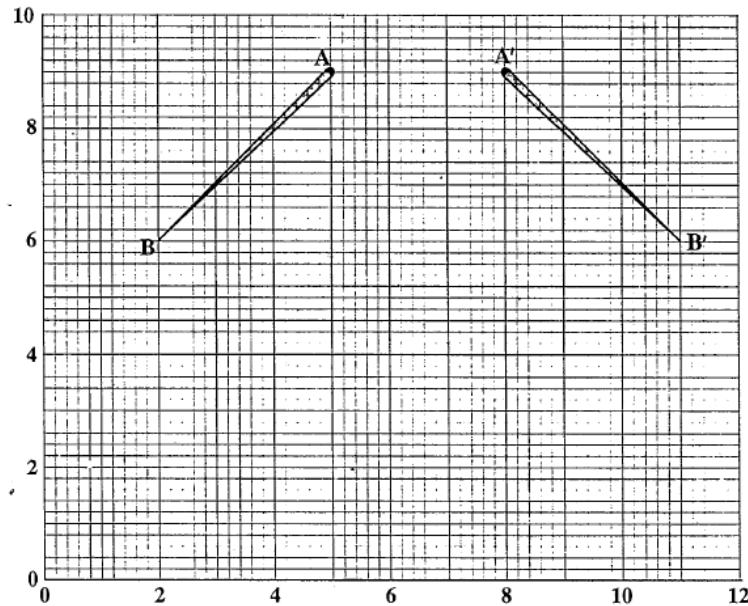


Figure 4

- Copy the figure on the graph paper provided. (1 mark)
- Draw the position of the mirror line. (2 marks)

**2005-11.**

**Figure 4** is a diagram of an E-shaped object.

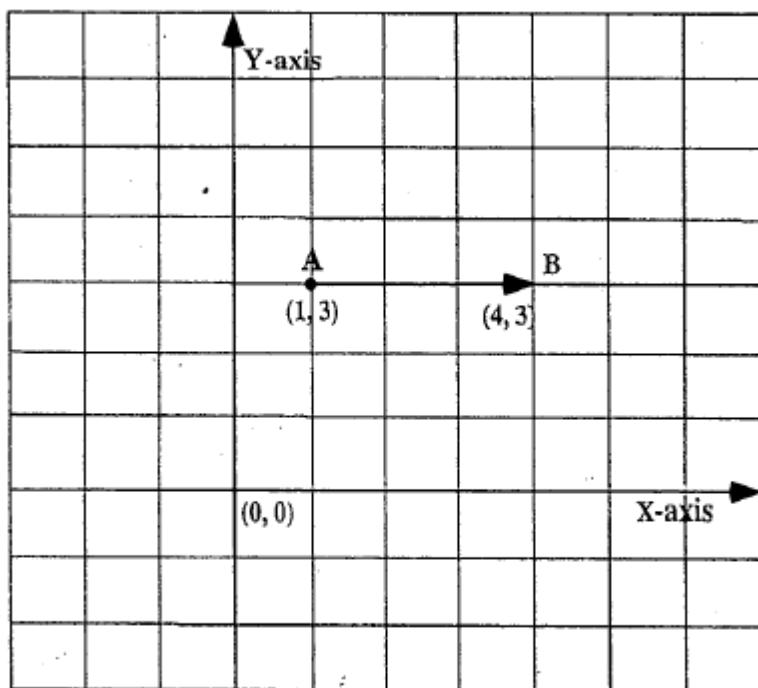


**Figure 4**

On the answer sheet provided, draw the object to show how it will appear after rotating it through an angle of  $270^\circ$  anti-clockwise. (2 marks)

**2004-15.**

Figure 4 shows an arrow AB with coordinates A (1, 3) and B (4, 3).



**Figure 4**

If the arrow is rotated  $90^\circ$  clockwise about Point A, find the new coordinates of B. (3 marks)

## Section B

**2012-19.** **Figure 7** shows a quadrilateral ABCD on a graph paper.

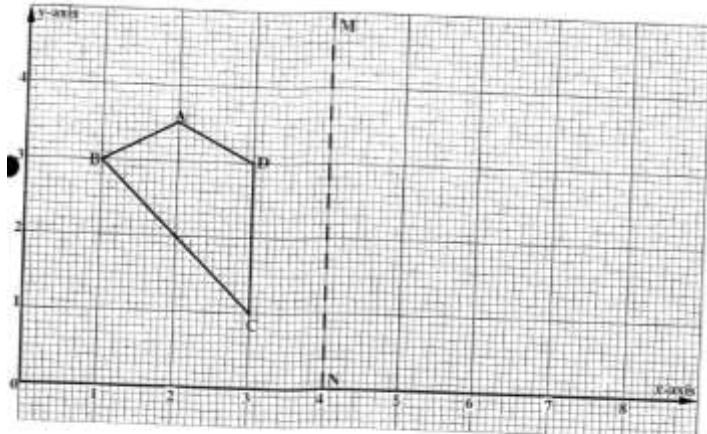


Figure 7

On the same graph paper, draw and label the reflection of the quadrilateral ABCD if the mirror line is MN. (4 marks)

**2009-18.**

a. **Figure 5** shows a triangle ABC on the Cartesian plane.

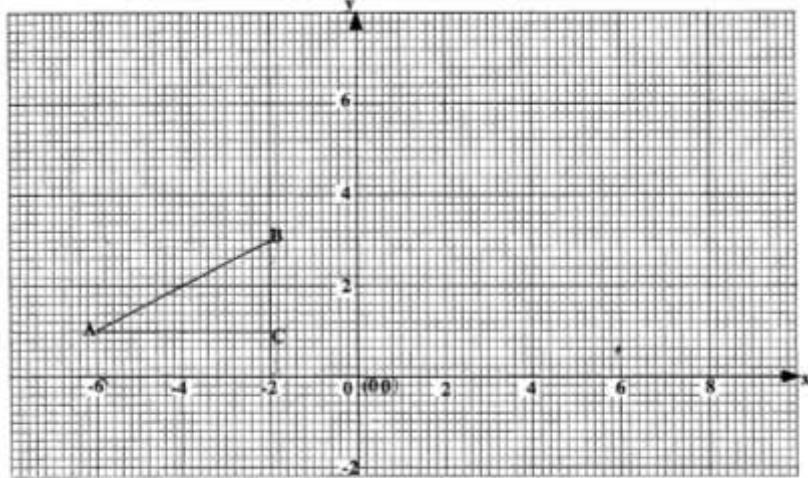


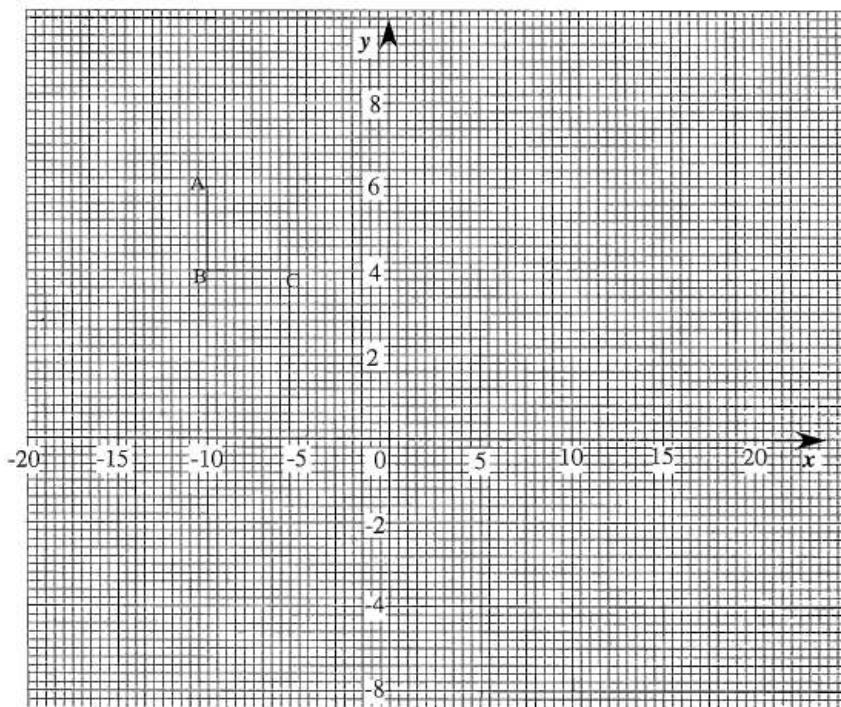
Figure 5

(i) Copy the figure on graph paper provided.

(ii) If triangle ABC is rotated through  $90^\circ$  clockwise about the point (0,0), draw its image. (4 marks)

**2008-16.**

**Figure 3** shows an L-shaped object on a graph.



**Figure 3**

- a. Copy the figure on the graph paper provided. (1 mark)
- b. On the same graph, draw and label the reflection of the object if the mirror line is the  $y$ -axis.  
(3 marks)
- c. What are the coordinates of  $C'$  in the reflection? (1 mark)

# 21 Triangles

## Section A

2011-12.

In **Figure 2** PQRS is a rectangle.

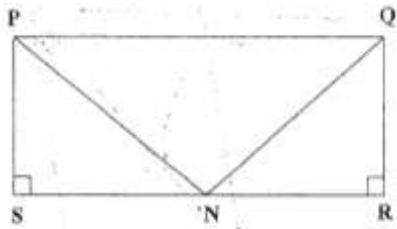


Figure 2

If  $SN = RN$ , show that triangle PSN is congruent to triangle QRN. (4 marks)

2011-13.

In **Figure 3**  $UQ,  $QT = QR$ , angle  $PQU = 68^\circ$  and angle  $TRS = 18^\circ$ .$

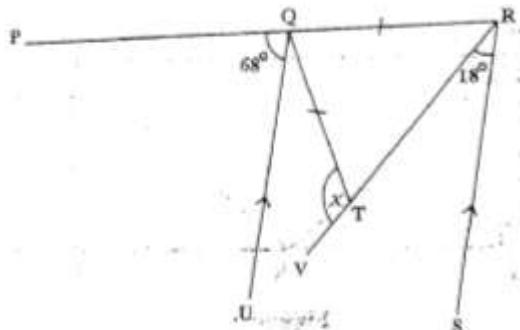


Figure 3

Calculate angle  $QTV$ . (5 marks)

2009-12.

In **Figure 2** HC and DG are straight lines. Angle  $CBF = 92^\circ$ , angle  $ABE = 35^\circ$  and  $AB$  is parallel to  $DG$ .

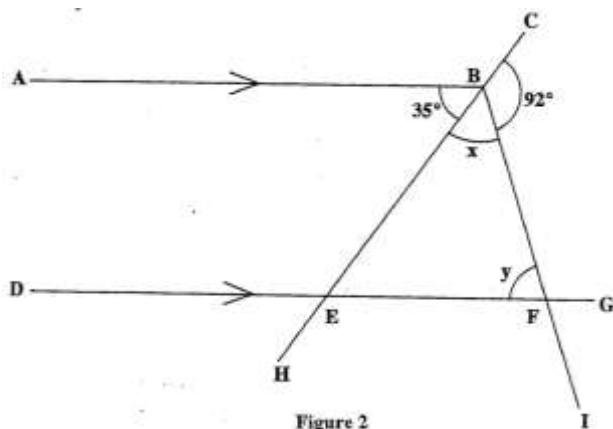
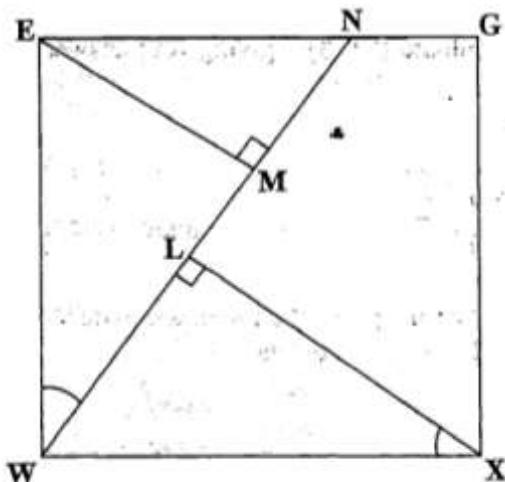


Figure 2

Calculate angles marked  $x$  and  $y$ . (6 marks)

**2009-14.**

- b. In **Figure 3** **N** lies on a side of the square **EGXW**. **EM** and **XL** are perpendicular to **WN**. Angle **EWM** = angle **WXL**.

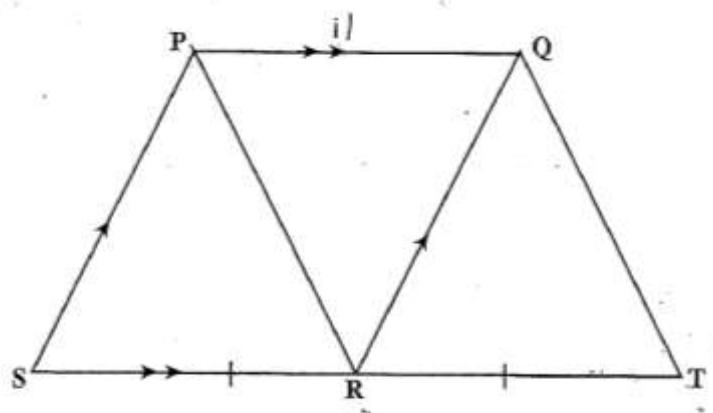


**Figure 3**

Show that triangle **WME** and **XLW** are congruent. (4 marks)

**2007-14.**

- b. In **Figure 2**, **PQRS** is a parallelogram. **QT** meets **SR** produced at **T**.



**Figure 2**

If **SR=RT**, prove that triangle **PSR** is congruent to triangle **QRT**. (4 marks)

**2004-1.** In an acute angled triangle **PQR**, angle **P** =  $65^\circ$  and angle **Q** =  $50^\circ$ . Find the size of angle **R**.

(4 marks)

## Section B

**2006-17.** In **Figure 5**, LK is parallel to MS and LM=MS

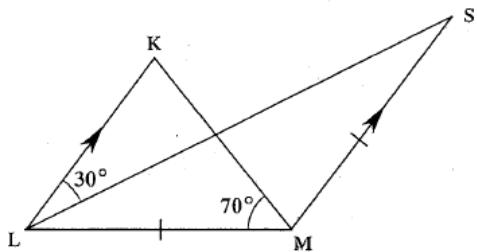


Figure 5

If KM and LS are straight lines, angle KLS=30° and angle KML=70°,

- calculate the value of the angle KMS. (5 marks)
- what type of triangle is KLM? (3 marks)

**2005-16. Figure 7** shows a rectangular floor **AB CD** in which **N** is the mid-point of **AB**.

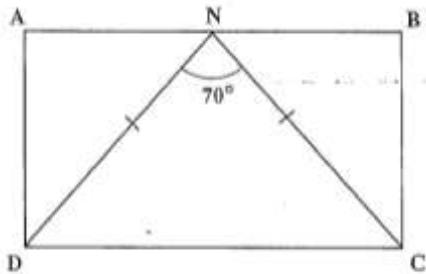


Figure 7

If **ND = NC** and angle **DNC = 70°**, calculate the value of the angle **AND**. (5 marks)

**2003-18. a.** In **Figure 6**,  $QL = PM$ ,  $LM = MN$  and angle  $QLM = \text{angle } NML = 90^\circ$ .

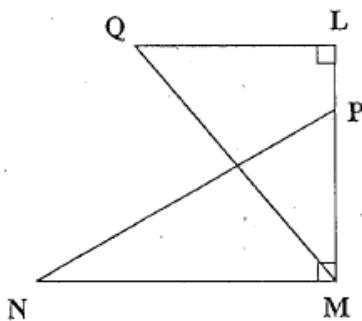


Figure 6

Prove that triangles **LMQ** and **MNP** are congruent. (4 marks)

## 22 Convex polygons

### Section A

**2011-6.**

The sum of the interior angles of a regular convex polygon is  $1440^\circ$ . Calculate the size of each-exterior angle of the polygon. (5 marks)

**2010-7.**

b. The sum of interior angles of a regular polygon is  $1980^\circ$ . Calculate the number of sides of the polygon. (4 marks)

**2007-12.**

The sum of the interior angles of a regular convex polygon is  $2340^\circ$ . Calculate the exterior angle of the polygon. (6 marks)

**2006-15.**

The sum of the interior angles of a regular convex polygon is  $1620^\circ$ . Calculate the number of sides of the polygon. (5 marks)

**2005-14.**

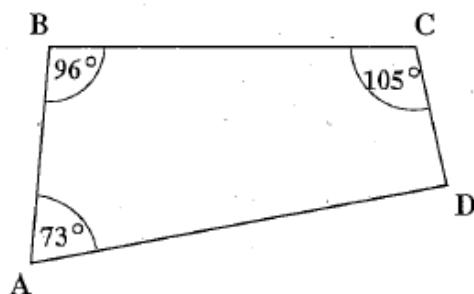
The interior angle of a regular convex polygon is  $168^\circ$ . Calculate the number of sides of the polygon. (4 marks)

**2004-13.**

A convex polygon has 21 sides. Find the sum of the interior angles of the polygon. (4 marks)

**2003-4.**

In **Figure 2**, ABCD is a quadrilateral in which angle ABC =  $96^\circ$ , angle BCD =  $105^\circ$  and angle BAD =  $73^\circ$ .



**Figure 2**

Calculate the size of angle ADC. (3 marks)

## Section B

**2012-16.**

**Figure 6** shows a pentagon ABCDE in which angle ABC =  $3y^\circ$ , angle BCD =  $100^\circ$ , angle CDE =  $114^\circ$ , angle DEA =  $y^\circ$  and angle EAB =  $126^\circ$ .

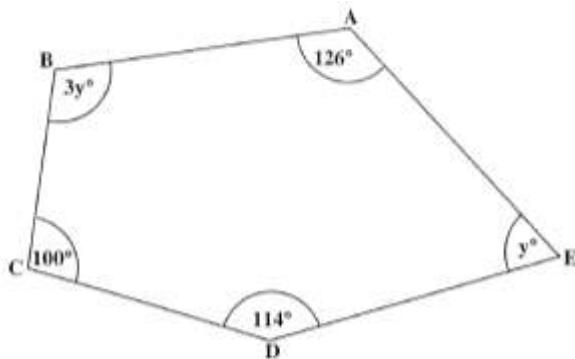


Figure 6

Calculate the size of angle DEA. (5 marks)

**2008-17.**

In **Figure 4**, ABCDE is a convex pentagon in which angle BCD =  $85^\circ$ , angle CDE =  $115^\circ$  and angle DEA =  $120^\circ$ .

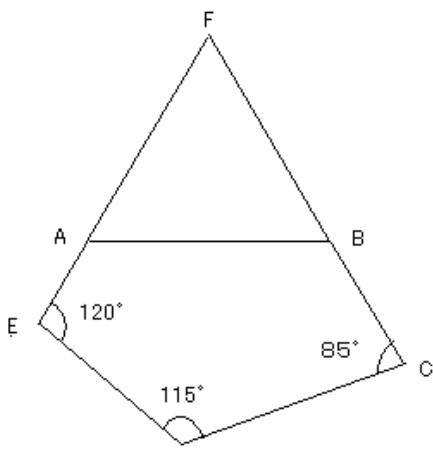


Figure 4

a. If EA and CB are produced to meet at F, calculate angle AFB. (3 marks)

b. Given that angle ABC =  $110^\circ$ , what type of triangle is AFB? (3 marks)

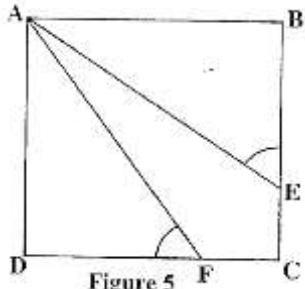
**2003-18.**

b. Each interior angle of a regular convex polygon is two times the exterior angle. Calculate the number of sides of the polygon. (4 marks)

# 23 Similarity

## Section A

2012-13. b. In **Figure 5**, ABCD is a square.



If angle **BEA** = Angle **DFA**, Show that triangle **BEA** is similar to triangle **DFA**. (3 marks)

2011-9. In **Figure 1** triangle **AEB** is similar to triangle **CED**.

**AC** =  $x$  cm, **CE** = 4 cm, **BD** = 6 cm and **DE** = 9 cm.

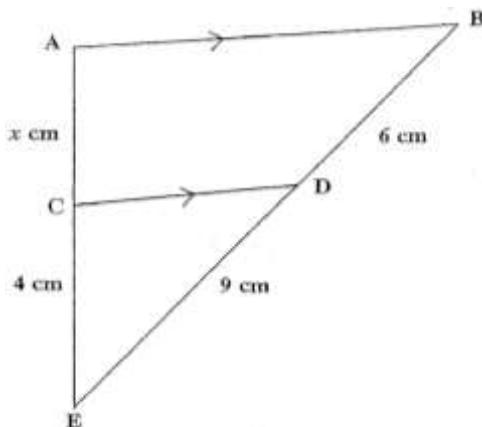
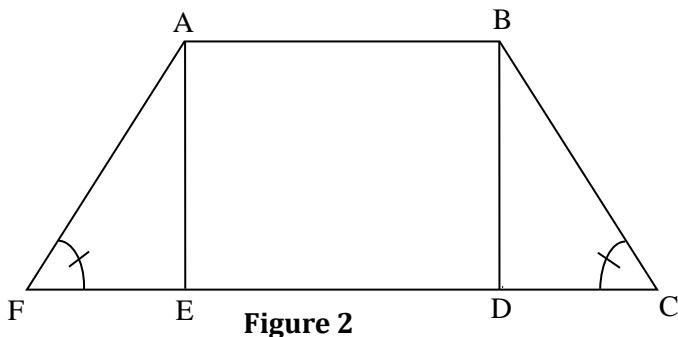


Figure 1

Calculate the value of  $x$ . (5 marks)

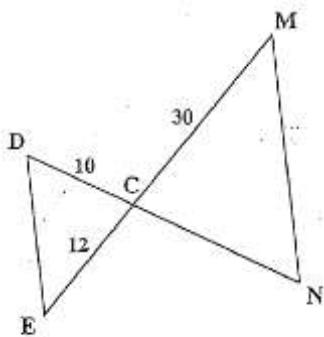
2010-8. In **Figure 2**, **ABDE** is a rectangle, angle **AFE** = angle **BCD**.



Show that triangle **AFE** is similar to triangle **BCD**. (4 marks)

**2005-15.**

b. **Figure 6** shows two similar triangles **DCE** and **NCM**. **DC=10cm**, **CE=12 cm** and **CM=30cm**.

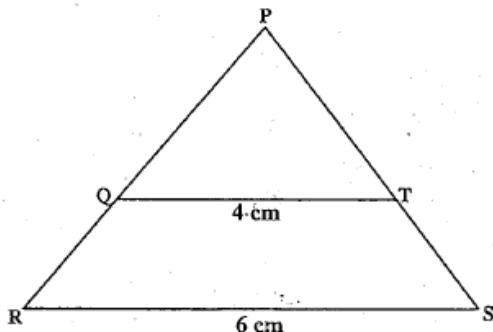


**Figure 6**

Calculate the length of **CN**. (4 marks)

**2004-12.**

In **Figure 2**, triangle PQT is similar to triangle PRS in which **RS = 6 cm**, **QT = 4 cm** and **PT = 3 cm**.

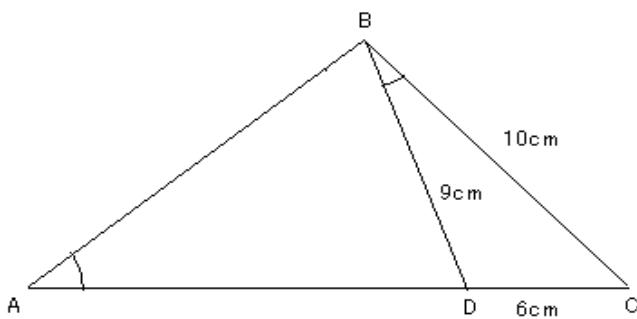


**Figure 2**

Calculate the length of **PS**. (4 marks)

## **Section B**

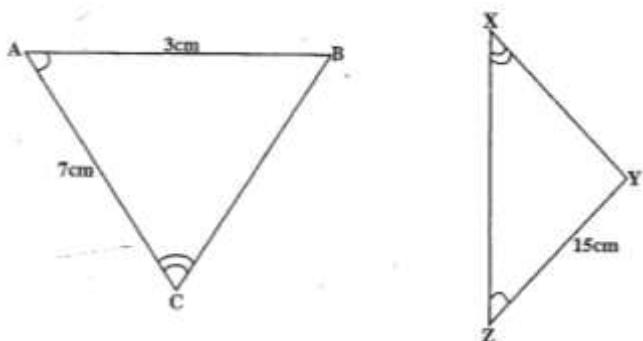
**2008-18. b.** In **Figure 5** triangle **ABC** is similar to triangle **BDC**. Angle **BAC = angle DBC**, **BD = 9 cm**, **BC = 10 cm** and **DC = 6 cm**.



**Figure 5**

Calculate the length of **AB**. (4 marks)

**2007-19.** a. **Figure 4** shows two similar triangles **ABC** and **ZYX**. Angle **BAC** = angle **XZY**, angle **ACB** = angle **YZX**, **AB** = 3 cm, **AC** = 7 cm and **YZ** = 15 cm.

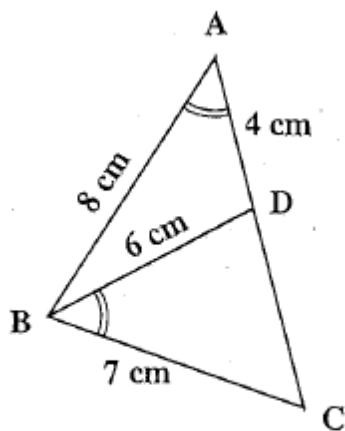


**Figure 4**

Calculate the length of **ZX**. (4 marks)

**2003-19.**

a. In **Figure 7**, angle **BAC** = angle **CBD**, **AB** = 8 cm, **BD** = 6 cm, **AD** = 4 cm, and **BC** = 7 cm.



**Figure 7**

(i) Prove that triangles **CAB** and **CBD** are similar.

(ii) Calculate, the length of **CD**. (6 marks)

## 24 Pythagoras's theorem

### Section A

2011-15.

**Figure 4** is a right angled triangle PQR in which  $PQ = d$  cm,  $QR = 8$  cm and  $PR = (d + 4)$  cm.

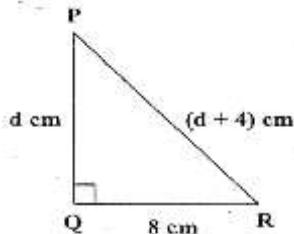


Figure 4

Calculate the value of  $d$ . (4 marks)

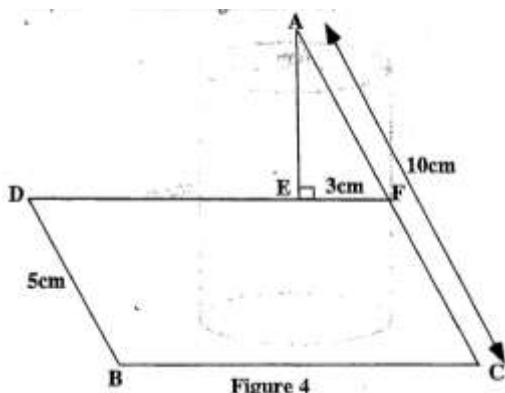
2003-11.

In a triangle ABC,  $AB=7\text{cm}$ ,  $AC= 3 \text{ cm}$  and angle  $ACB=90^\circ$ . Calculate the length of BC giving your answer correct to 2 significant figures. (5 marks)

### Section B

2009-17.

a. **Figure 4** shows a parallelogram  $BCFD$  and triangle  $AEF$ .  $AC = 10 \text{ cm}$ ,  $BD = 5 \text{ cm}$ ,  $EF = 3 \text{ cm}$  and angle  $\text{AEF} = 90^\circ$ .



Calculate  $AE$ . (5 marks)

2007-18.

b. In a triangle XYZ,  $XY = 3 \text{ cm}$ ,  $YZ = 4 \text{ cm}$  and  $XZ = 5 \text{ cm}$ . Show that triangle XYZ is right angled.  
(5 marks)

# 25 Quadrilaterals

## Section A

2012-9.

Figure 3 shows a parallelogram RSTU in which angle RUT =  $(2x + 30)^\circ$  and angle RST =  $(7x - 25)^\circ$ .

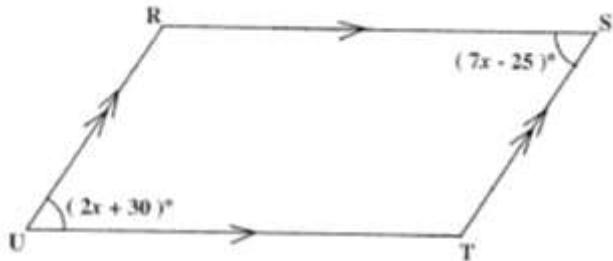


Figure 3

Calculate the size of angle RUT. (5 marks)

2005-12.

Figure 5 shows a trapezium GHJK in which GH is parallel to KJ, HJ=HR and angle HJR= angle GKR.

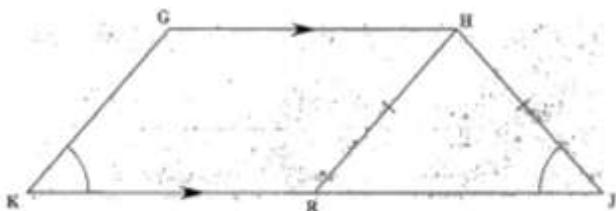


Figure 5

Prove that GHRK is a parallelogram. (4 marks)

## **Section B**

**2010-20.**

b. The diagonals of a rhombus **ABCD** are 12cm and 16cm. Calculate the area of the rhombus.

(5 marks)

**2008-19.**

b. In **Figure 6** **WXYZ** is a parallelogram in which **WX** is parallel to **ZY** and **ZW** is parallel to **YX**. Angle  $\angle WZY = (a^2 - 2a)^\circ$  and  $\angle WXY = 63^\circ$ .

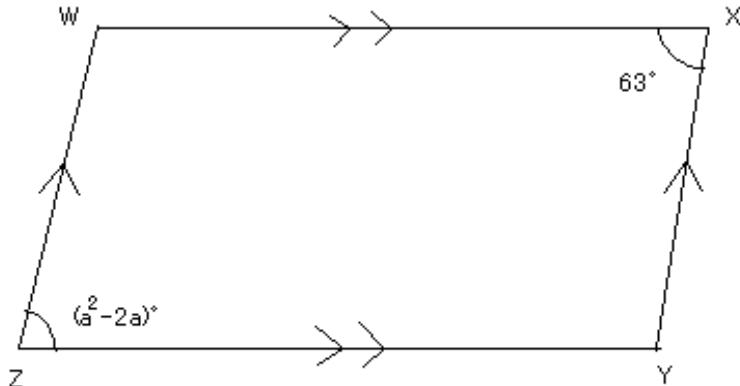


Figure 6

Calculate the values of  $a$ . (6 marks)

**2004-20.**

b. The diagonals of a rhombus are 10 cm and 24 cm. Calculate the length of a side of the rhombus.

(5 marks)

# 26 Mensuration

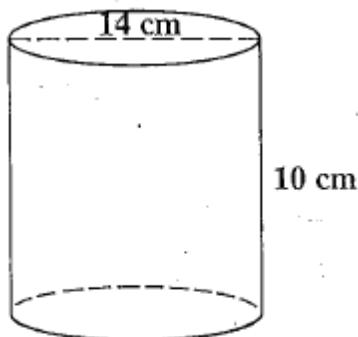
## Section A

**2007-14.**

- a. Calculate the volume of a cylinder whose radius is 7 cm and height 10 cm. (Take  $\pi = \frac{22}{7}$ ). (3 marks)

**2003-10.**

**Figure 4** shows a cylinder whose diameter is 14 cm and height is 10 cm.



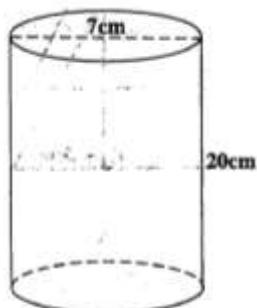
**Figure 4**

Taking  $\pi$  to be  $\frac{22}{7}$ , calculate the volume of the cylinder. (3 marks)

## Section B

**2009-19.**

**Figure 6** shows a closed cylinder with diameter 7 cm and height 20 cm.

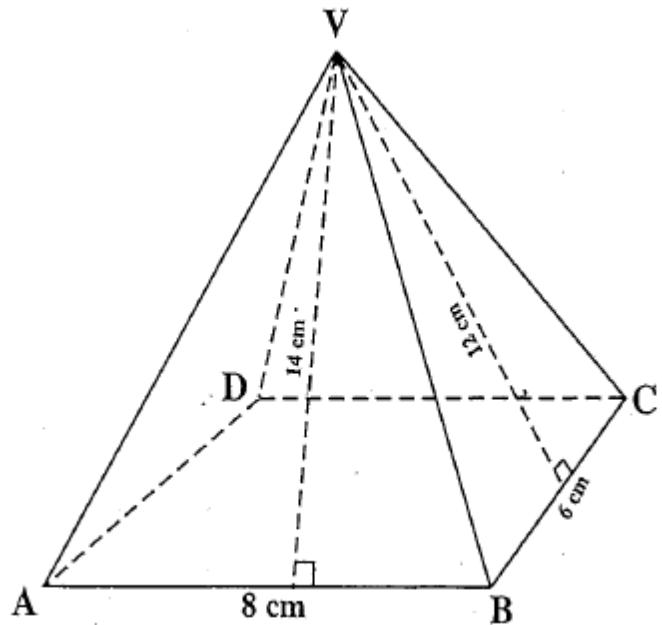


**Figure 6**

Calculate the total surface area of the cylinder. (Take  $\pi = \frac{22}{7}$ ). (6 marks)

**2004-16.**

**Figure 5** shows a right pyramid with a rectangular base ABCD measuring 8 cm by 6 cm. The heights of triangles VBC and VAB are 12 cm and 14 cm respectively.



**Figure 5**

Calculate the total surface area of the right pyramid. (6 marks)

# 27 Geometrical constructions

## Section A

**2007-15.**

- a. Using a ruler and a pair of compasses only, construct triangle **PQR** in which **PQ = 11cm**, **QR = 9 cm** and **PR = 7 cm**. (3 marks)

## Section B

**2012-20.**

- a. Using a ruler and a pair of compasses only, Construct in the same diagram:
- (i) a triangle **XYZ** in which **XY = 9 cm**, **YZ = 11 cm** and **ZX = 7 cm**.
  - (ii) the inscribed circle of the triangle **XYZ**. (5 marks)
- b. Measure and state the length of the radius of the circle. (1 mark)

**2011-20.**

Using a pair of compasses and a ruler only, construct in the same diagram:

- (i) a line **AB** which is 10 cm.
- (ii) point **C** which is equidistant from point **A** and point **B** and is also 6 cm from **AB**.
- (iii) measure and state angle **BAC**. (5 marks)

**2010-19.**

- a. Using a ruler and a pair of compasses only, construct in the same diagram:
- (i) a triangle **PQR** in which **PQ = QR = PR = 5cm**.
  - (ii) construct the circumscribed circle of the triangle **PQR**. (7 marks)

**2009-20.**

Using a ruler and a pair of compasses only, construct in the same diagram:

- a. A triangle **UVW** in which angle **WUV = 90°**, **UV = 5 cm** and **UW = 6 cm**. (3 marks)
- b. Produce line **UV** to point **X**, and line **UW** to point **Y**. Bisect angles **YWW** and **XVW**. The bisectors should meet at **Z**. (4 marks)
- c. Measure and state the length of line **UZ**. (1 mark)

**2008-18.**

- a. Using a pair of compasses and a ruler only, construct in the same diagram:
- (i) lines **AB** and **AC** such that **AB** = 8 cm, **AC** = 6 cm and angle **BAC** = 60°.
- (ii) the locus of a point equidistant from lines **AB** and **AC**. (6 marks)

**2006-19.**

Using a ruler and a pair of compasses only, construct in the same diagram:

- a. a line **AB** = 10 cm (1 mark)
- b. a locus of points equidistant from points A and B. Let P be a point on the locus such that AP=8 cm (3 marks)
- c. measure and state angle APB. (2 marks)

**2004-20.**

- a. Using a ruler and a pair of compasses only, construct triangle ABC in which **AB** = 9.0 cm, angle **BAC** = 150° and **CA** = 4.5 cm. Measure and state angle **ABC**. (6 marks)

**2003-17.**

Using a ruler and a pair of compasses only, construct in the same diagram:

- a. triangle PQR in which **PQ** = 8 cm, **QR**= 7 cm and **PR**= 6 cm. (4 marks)
- b. a locus of points equidistant from PR and PQ. If point S is on the locus such that PS=10 cm, measure and state the length of QS. (4 marks)