

Candidate Name \_\_\_\_\_

Class

Reg Number

--	--

**TANJONG KATONG SECONDARY SCHOOL**  
**Mid-Year Examination 2007**  
**Secondary One (Express)**

**MATHEMATICS****Part 1**

Tuesday  
1 hour

8<sup>th</sup> May 2007**TIME 0750 – 08 50****INSTRUCTION TO CANDIDATES**

Write your name, class and register number in the spaces at the top of this page and on all the pages.

Answer **ALL** the questions in this paper.

Answers and working are to be written on the question paper in the spaces provided, and the question paper is to be handed in at the end of the examination.

All working must be clearly shown.

Omission of essential working will result in loss of marks.

Calculators are **not allowed** in this paper.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

You are reminded of the need for clear presentation in your answers.

Marks	50
-------	----

**This question paper consists of 9 printed pages.**

**[Turn Over**

- 1
- (a) List the perfect squares more than 1 and less than or equal to 50.
- (b) Express 0.090909 correct to 3 significant figures.
- (c) Arrange the following numbers in ascending order:

$$0.\dot{1}\dot{7}, \quad -\left| -0.1\dot{7} \right|, \quad 0.1777, \quad \frac{89}{500}$$

- Answer: (a) \_\_\_\_\_ [1]
- (b) \_\_\_\_\_ [1]
- (c) \_\_\_\_\_ [1]

- 2 The numbers 70 and 135, written as products of their prime factors are

$$70 = 2 \times 5 \times 7 \quad 135 = 3^3 \times 5$$

Find

- (a) the largest integer which is a factor of both 70 and 135,
- (b) the smallest integer which is an exact multiple of both 70 and 135.

- Answer: (a) \_\_\_\_\_ [1]
- (b) \_\_\_\_\_ [2]

3 From the list of numbers

$$\sqrt{64}, \quad -\frac{7}{3}, \quad 1.\dot{4}3\dot{5}, \quad 3 \times 2^2, \quad 1.2, \quad \sqrt[11]{2}$$

Write down

- (a) an irrational number,  
 (b) a perfect cube.

Answer: (a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [1]

4 An orange costs  $p$  cents while an apple costs  $q$  cents more than an orange.

Find, in terms of  $p$  and  $q$ ,

- (a) the cost of an apple,  
 (b) the cost of 3 oranges and 8 apples.

Answer: (a) \_\_\_\_\_ cents [1]

(b) \_\_\_\_\_ cents [2]

5 Find the value of  $\frac{a(b-c^2)}{d}$  when  $a = -2$ ,  $b = 7$ ,  $c = -1$  and  $d = -3$ .

Answer: \_\_\_\_\_ [3]

---

6 Simplify  $\frac{2x^2}{3y} \times \frac{5x^2y}{2} \div \frac{8x^3}{15y}$ .

Answer: \_\_\_\_\_ [2]

- 7 (a) Find  $a$ ,  $b$ ,  $c$ , and  $d$  if  $5544 = 2^a \times 3^b \times 7^c \times 11^d$ .
- (b) Hence use your result in (a) or otherwise, find the least value of  $n$  if  $5544n$  is a perfect square.

Answer: (a)  $a =$  \_\_\_\_\_

$b =$  \_\_\_\_\_

$c =$  \_\_\_\_\_

$d =$  \_\_\_\_\_ [4]

(b)  $n =$  \_\_\_\_\_ [1]

8 (a) Estimate the value of  $\frac{7.98 \times \sqrt{9.02}}{0.304}$

(b) Use your result in (a) or otherwise, estimate the value of  $\frac{798 \times \sqrt{902}}{3040}$

Answer: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [2]

9 Evaluate

(a)  $[(14 - 59) \div 5 \times 3] - (23 - 17) \times (-2),$

(b)  $\sqrt{\frac{1}{81}} \times |-3| - \left[ \left( \frac{4}{5} \right) \times \left( -1 \frac{9}{16} \right) \right].$

Answer: (a) \_\_\_\_\_ [3]

(b) \_\_\_\_\_ [4]

10 (a) Simplify  $\frac{4x+3}{2} - \frac{x-3}{8}$ .

(b) Hence or otherwise, solve the equation  $\frac{4x+3}{2} = \frac{x-3}{8} + 4$ .

Answer: (a) \_\_\_\_\_ [2]

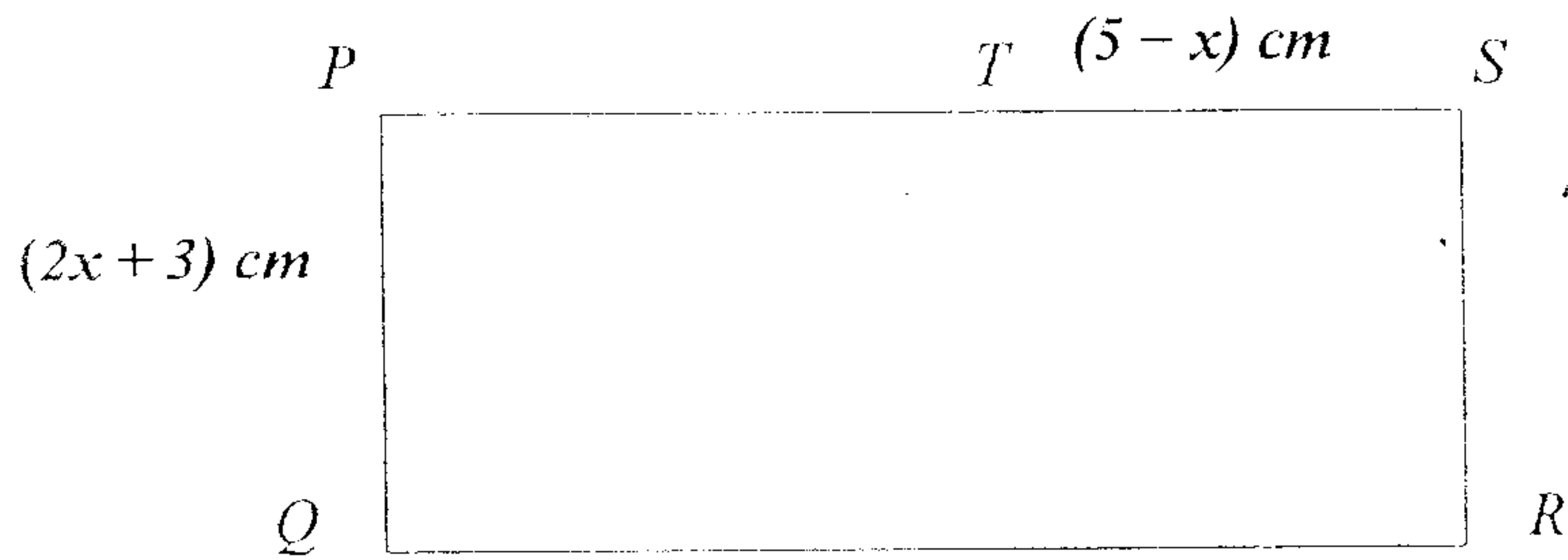
(b) \_\_\_\_\_ [2]

11 If  $\frac{3x+2y}{4x+5y} = -\frac{2}{9}$ , find the value of  $\frac{x}{y}$ .

Answer:  $\frac{x}{y} =$  \_\_\_\_\_ [3]

- 12 The perimeter of rectangle  $PQRS$  shown in the diagram is  $(14x - 10)$  cm. Given that  $PQ = (2x + 3)$  cm and  $T$  is a point on  $PS$  such that  $TS = (5 - x)$  cm, find an expression in terms of  $x$  in its simplest form for

- (a)  $QR$ ,  
 (b)  $PT$ .



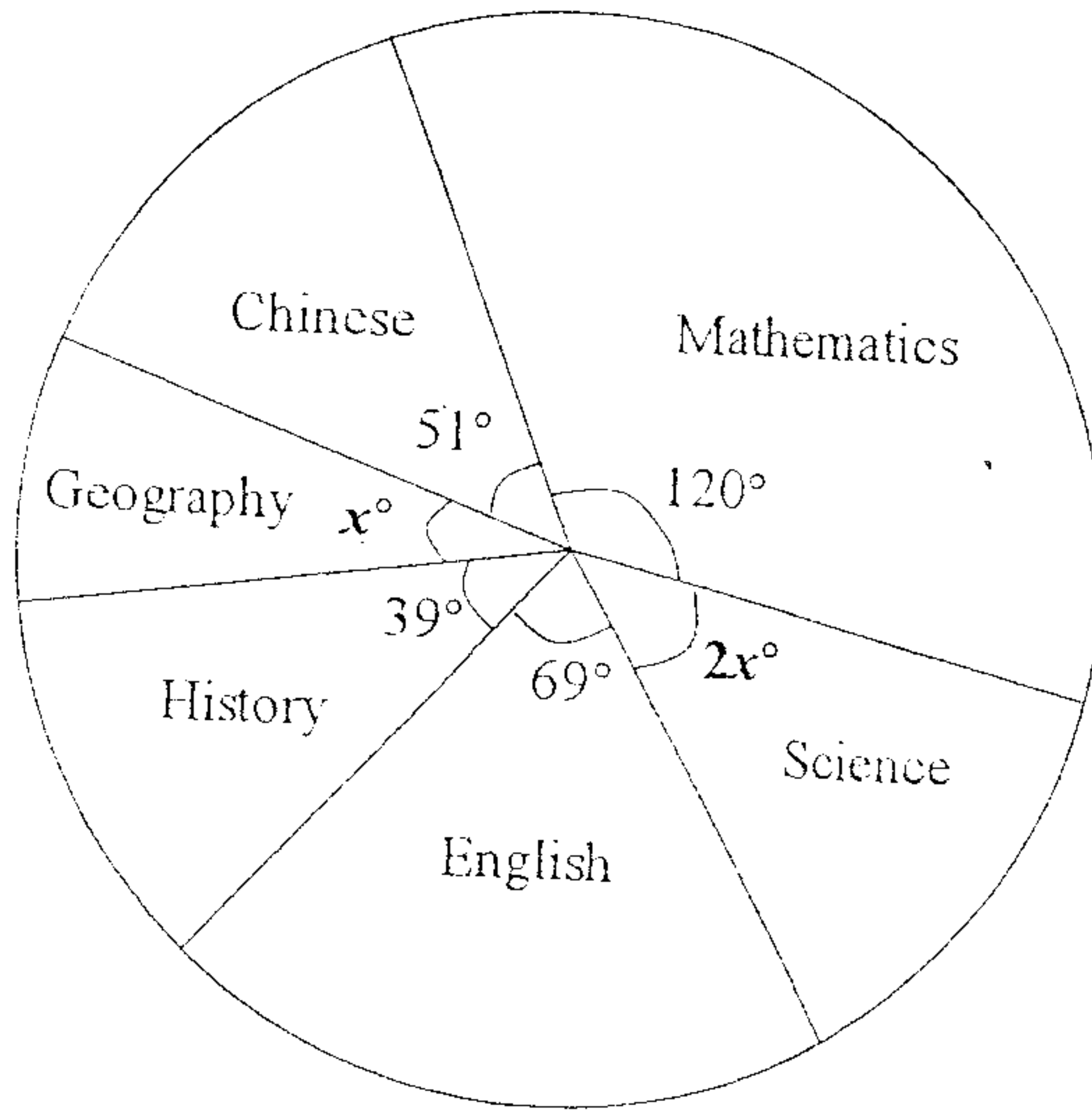
Answer:  $QR =$  \_\_\_\_\_ [3]

$PT =$  \_\_\_\_\_ [2]



13 The pie chart illustrates the favourite subjects of 120 Secondary One students in Tanjong Katong Secondary School.

- (a) Calculate the value of  $x$ .
- (b) Find the number of students who chose Mathematic as their favourite subject.
- (c) Calculate the percentage of students who chose Science as their favourite subject.



Answer: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [2]

(c) \_\_\_\_\_ [2]

---End of paper ---

Candidate Name \_\_\_\_\_

Class

Reg Number

--	--

## TANJONG KATONG SECONDARY SCHOOL

Mid-Year Examination 2007  
Secondary One (Express)



## MATHEMATICS

## Part 2

Tuesday

8 May 2007

1 hour 30 minutes

TIME 09 50 – 11 20

## INSTRUCTION TO CANDIDATES

Answer **ALL** the questions in **Section A**.  
Answer only **ONE** question in **Section B**.

All working must be clearly shown.  
Omission of essential working will result in loss of marks.

## INFORMATION FOR CANDIDATES

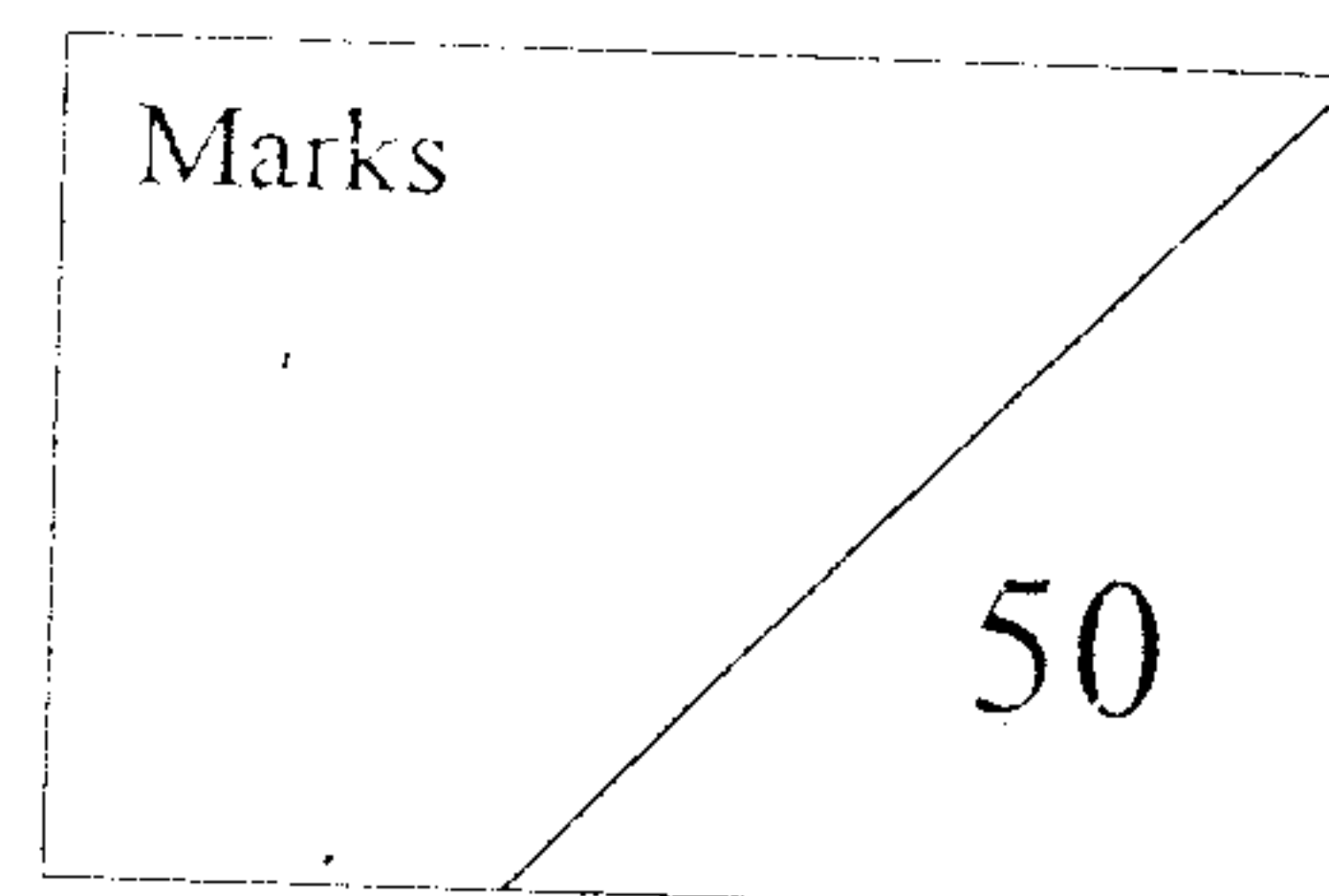
The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

You are expected to use an electronic calculator to evaluate explicit numerical expressions.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.

You are reminded of the need for clear presentation in your answers.



This question paper consists of 9 printed pages.

[Turn over

**Section A (43 marks)**Answer **ALL** the questions in this section.

1. With the use of a calculator, evaluate:

(a)  $58^2 \div \sqrt[3]{24389} \times \sqrt{3721} + 33^2$ , giving your answer correct to 2 significant figures,

(b)  $\frac{7^3 \times \sqrt{578} + \sqrt[3]{512}}{\sqrt{7744} - 2^3}$ , giving your answer correct to 2 decimal places.

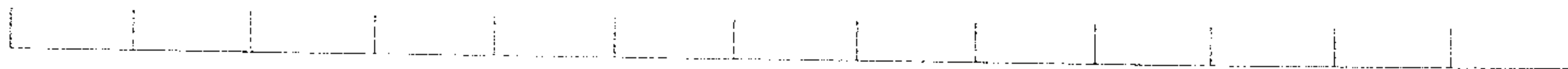
(a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [1]

2. The total marks for a Mathematics class test is 50. The data below shows the marks scored by 20 students in this test.

42	42	49	25	34	42	40	43	32	47
26	35	40	45	42	42	31	45	40	41

(i) Draw a dot diagram to represent the above data. [2]



(ii) State the lowest score. [1]

(iii) State the highest score. [1]

(iv) Based on the dot diagram in (i), make an observation about the difficulty level of the test paper and support it with a reason. [2]

3. (a) Lydia and Siti are at the bus stop and both had just missed their buses. They want to accompany each other until both their buses come at the same time. Lydia's bus comes every 15 minutes while Siti's bus comes every 21 minutes. How many more minutes will they have to wait before both can board their bus? [2]

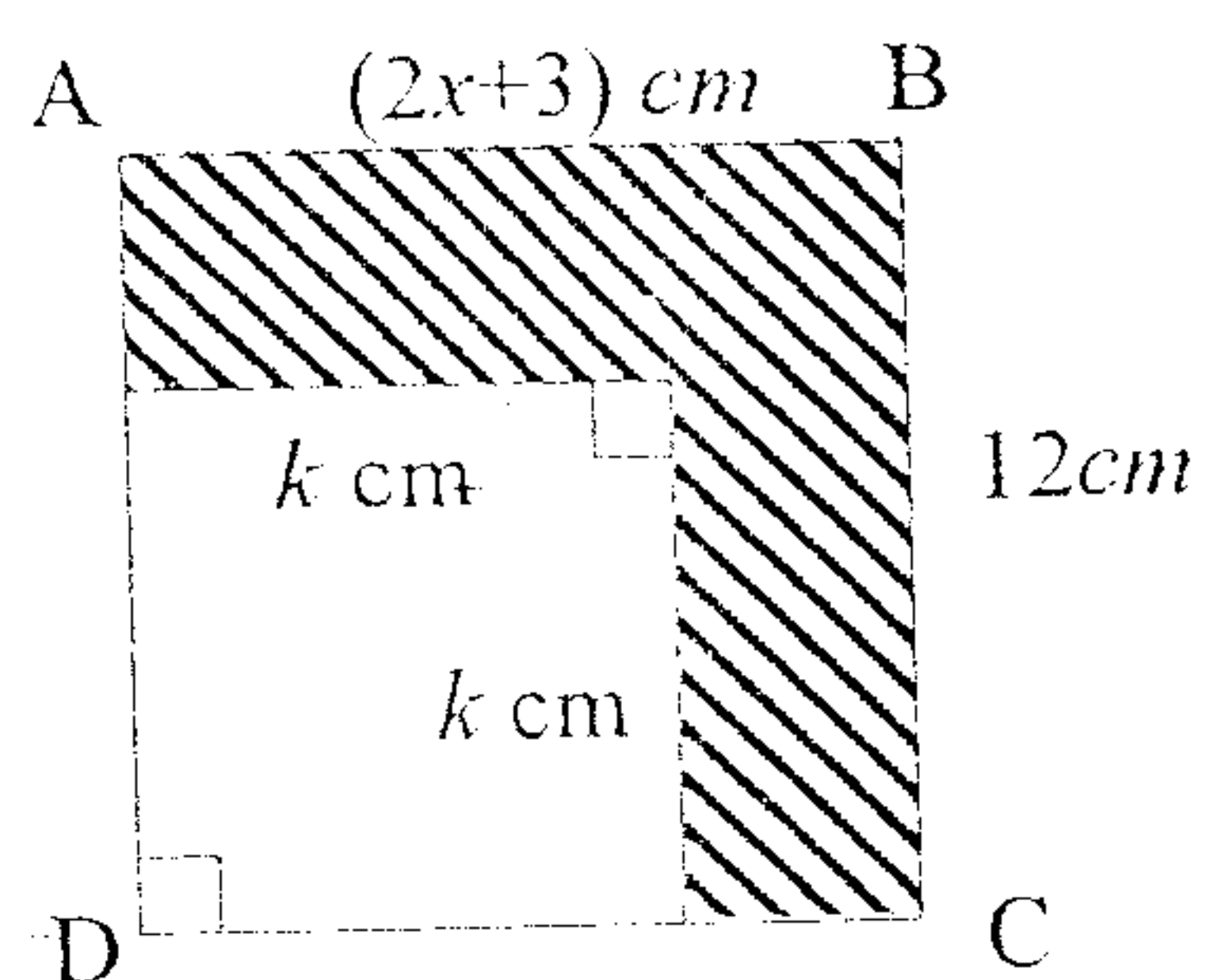
- (b) Find the Highest Common Factor (HCF) of  $4pqr^3s$ ,  $8p^2qs^2$  and  $10q^3rs^3$ . [2]

4. Factorise completely.

(a)  $10xy^2 - 15x^2y$ , [1]

(b)  $15a(x - y) + 12b(y - x)$ , [3]

5. The sum of the ages of Ronny and Julia is 38. Seven years ago, Ronny was three times as old as Julia. Using algebraic method, find their present ages. [4]



6. ABCD is a square.  
 (a) Form an equation in  $x$  and solve it. [2]  
 (b) If the area of the shaded portion is  $63 \text{ cm}^2$ , find the value of  $k$ . [3]

7. Simplify the following:

(a)  $\sqrt{\frac{9x^2}{49}} \div \frac{9y}{2x^3}$

[2]

(b)  $5h - 3\{4k - 6m + 2[3h - (2h + 3k)]\}$

[4]

8. (a) Subtract  $3x(2x^2 - 2x + 7)$  from  $4x^3 + 7x^2 - 8x + 2$  and express your answer so that the degrees of the terms are in descending order.

[3]

(b) Solve  $\frac{x+1}{3} - \frac{2x-3}{2} = x - \frac{1}{6}$ .

[4]

9. The following are the weight of 30 boxes in kilograms (kg).

60	63	84	86	86	86
87	88	88	89	89	90
90	90	90	90	90	91
92	92	93	93	93	96
96	97	97	100	101	102

(a) Represent this data in a single-ordered stem and leaf diagram.

[3]

(b) Write down the most common weight.

[1]

(c) 60% of the boxes have a mass of below  $p$  kg. Find the value of  $p$ .

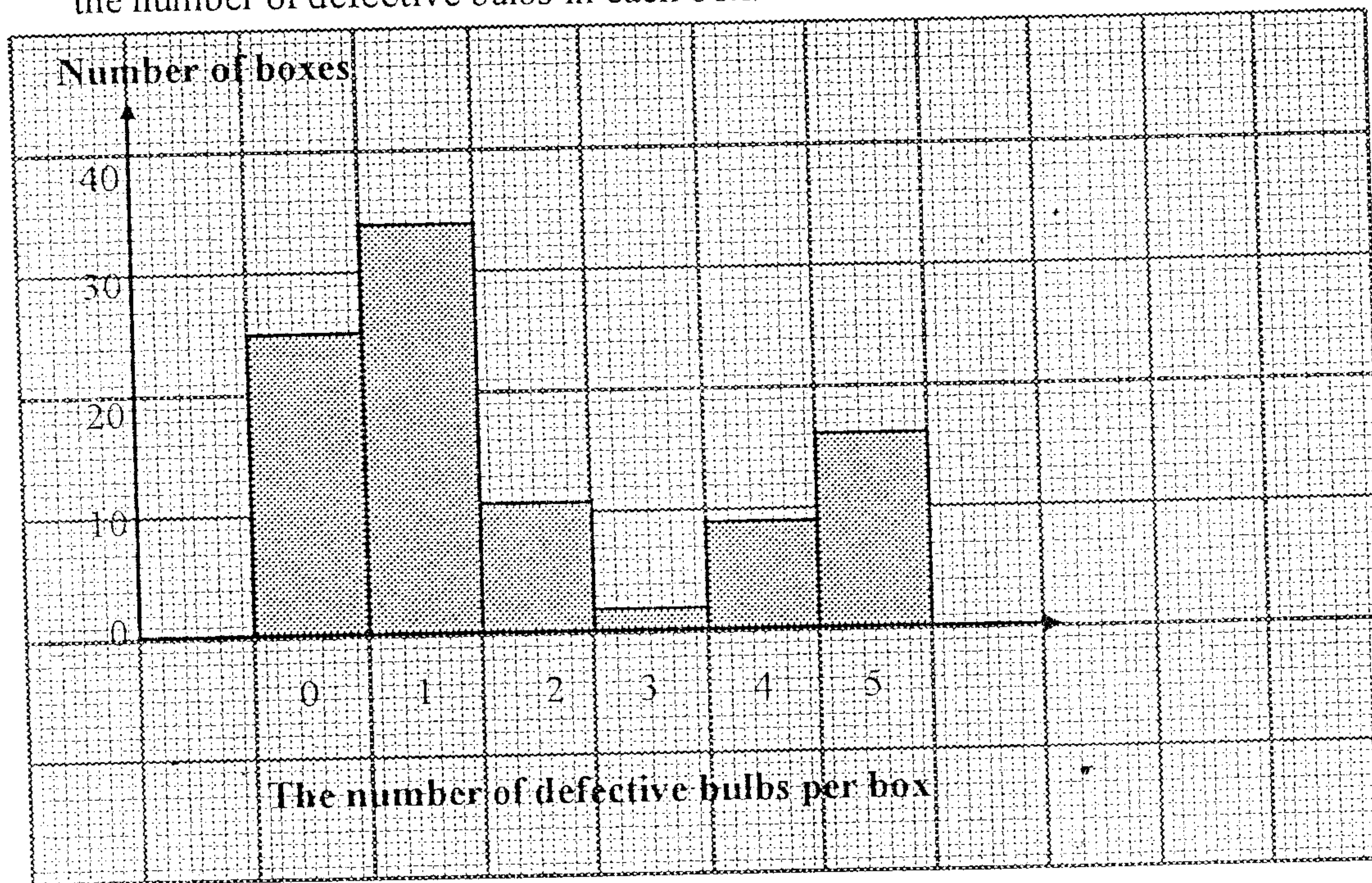
[1]



**Section B (7 marks)**

Answer **ONE** question only in this section.

10. The contents of 97 boxes of bulbs are examined. The diagram shows a histogram for the number of defective bulbs in each box.



(a) How many boxes contain no defective bulbs? [1]

(b) Write down the most frequent number of defective bulbs found in the boxes. [1]

(c) How many boxes contain at least 2 defective bulbs? [2]

(d) If there are 2000 bulbs altogether, find the percentage of defective bulbs. Correct your answer to 1 significant figure. [3]

11. (a) When the sum of  $2k$  and 15 is divided by 9, the result is 11.  
Find the value of  $k$ .

[3]

- (b) Tom has 54 coins which are either 20-cents or 50-cents coins.  
In total, Tom has \$20.70. Let the number of 50-cents coins be  $x$ .

- (i) Form an equation involving  $x$  and solve it.  
(ii) Hence, find the number of 20-cent coins Tom has.

[3]

[1]

End of Paper

## Mid-Year Mathematics Paper 1 (Numerical Answers)

1(a)  $4, 9, 16, 25, 36, 49$

(b)  $0.0909$

(c)  $-\overline{0.17}, \overline{0.17}, 0.1777, \frac{89}{500}$

2(a)  $5$

(b)  $1890$

3(a)  $\sqrt{\frac{2}{11}}$

(b)  $\sqrt{64}$

4(a)  $p + q$

(b)  $11p + 8q$

5.  $4$

6.  $\frac{25xy}{8}$

7(a)  $a = 3,$

$b = 2$

$c = 1$

$d = 1$

(b)  $154$

8(a)  $80$

(b)  $8$

9(a) -15

(b)  $1\frac{7}{12}$

10(a)  $\frac{15x + 15}{8}$

(b)  $1\frac{2}{15}$

11.  $-\frac{4}{5}$

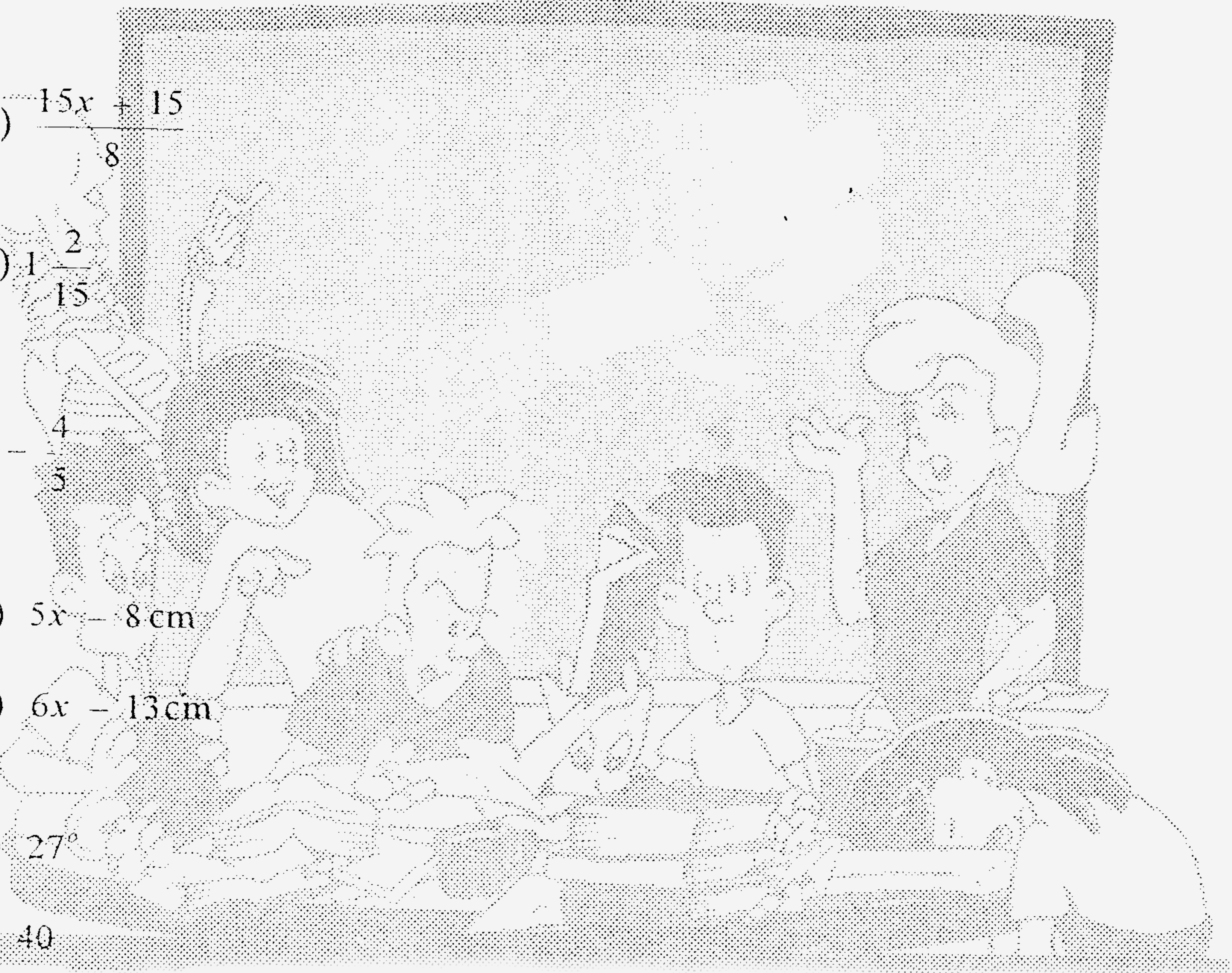
12(a)  $5x - 8 \text{ cm}$

(b)  $6x - 13 \text{ cm}$

13(a)  $27^\circ$

(b) 40

(c) 15%



## Paper 2 Numerical Answers

1a) 8200

b) 103.18

2 ii) 25

iii) 49

iv) **The paper is relatively easy because:**

- 14 out of 20 students scored 40 marks and above.
- 70% of the students scored 40 marks and above.
- None of the students fail the test.

3a) 105 minutes

b) 2qs

4a)  $5xy(2y-3x)$ b)  $3(x-y)(5a-4b)$ 

5) 25 and 13 years old

6a)  $x=4.5$ b)  $k=9$ 7a)  $\frac{2x^4}{21y}$ b)  $-h+18m+6k$ 8a)  $-2x^3+13x^2-29x+2$ b)  $x = \frac{12}{10} = 1\frac{1}{5}$ 

9b) 90 kg

c)  $p=92$ 

10a) 25 bulbs

b) 1 bulb

c) 38 boxes

d) 9%

11a)  $k=42$ bi)  $x=33$ 

ii) 21