

Index no.	
Total	/ 50



Anglo-Chinese School (Barker Road)

MID-YEAR EXAMINATION 2007

SECONDARY ONE
EXPRESS

MATHEMATICS
PART 1

1 HOUR

INSTRUCTIONS TO CANDIDATES:

- Write your index number in the box above.
- Answer **all** the questions in the space provided on the question paper.
- All workings must be clearly shown.
- The omission of essential steps will result in loss of marks.
- The use of calculators **IS** allowed.
- The intended marks for each question or part of questions are given in brackets [] at the end of the question.
- The total marks for this paper is 50.
- Give non-exact numerical answer correct to 3 significant figures or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

This question paper consists of 10 printed pages.

1. Subtract $(x^2 - xy + y^2)$ from the sum of $(4x^2 - 9xy)$ and $(xy + y^2)$.

Answer: _____ [2]

2. Factorise the following.

(a) $3x + 15$

(b) $6h(x - 2y) + 5(x - 2y)$

Answer: (a) _____ [1]

(b) _____ [1]

3. Find the value of

(a) $\frac{-16 + [(-15) \div 3]}{6 - (-9)}$,

(b) $\frac{2.4 + \sqrt[3]{0.027}}{(-1)^2 \div 1.6}$

Answer: (a) _____ [2]

(b) _____ [2]

4. Study the numbers below.

$$-\frac{5}{8}, \sqrt{3}, 7, 9, 0.6, \frac{13}{2}, \pi, 1, \sqrt{2^2 + 3^2},$$

Which of the number(s) is/are

- (a) integers?
 (b) prime numbers?
 (c) irrational numbers?

Answer: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

5. Express 123.495, correct to
- (a) 2 decimal places,
 - (b) 2 significant figures,
 - (c) the nearest 10.

Answer: (a) _____ [1]
(b) _____ [1]
(c) _____ [1]

6. (a) Find the Highest Common Factor (HCF) of 18, 24 and 36.
(b) The Lowest Common Multiple (LCM) of 10, 15 and p is 150. Given that $p > 15$, find the two possible values of p which are odd numbers.

Answer: (a) _____ [2]
(b) $p =$ _____ or _____ [2]

7. The temperature of a beef patty was -4°C when taken out of a freezer. The beef patty was immediately warmed in a frying pan, and after 4 minutes its temperature was 86°C .
- (a) Find the increase in temperature during the 4-minute interval.
- (b) Given that the temperature of the beef patty increased at a constant rate, calculate the temperature of the beef patty after 1 minute on the frying pan.

Answer: (a) _____ $^{\circ}\text{C}$ [1]

(b) _____ $^{\circ}\text{C}$ [2]

8. Sam bought a box of pens. $\frac{1}{4}$ of them were red pens and the rest of them were blue. He gave away $\frac{1}{2}$ of the red pens and $\frac{1}{3}$ of the blue pens to his classmates. He has 30 pens left. How many pens were there in the box?

Answer: _____ [3]

9. Given that $a = 3$, $b = 7$ and $c = -2$, find the value of $\frac{5b + c^2}{2b - a}$. Express your answer as
- (a) a fraction,
 - (b) a recurring decimal.

Answer: (a) _____ [2]

(b) _____ [1]

10. (a) Expand $6(4 - x)$.
(b) Simplify $1 - 3(1 + x) + 2 - (4x - 7)$.

Answer: (a) _____ [1]

(b) _____ [2]

11. Solve the following equations.

(a) $4m + 5 = 21$

(b) $2(n - 3) - 3(4 - n) = 7$

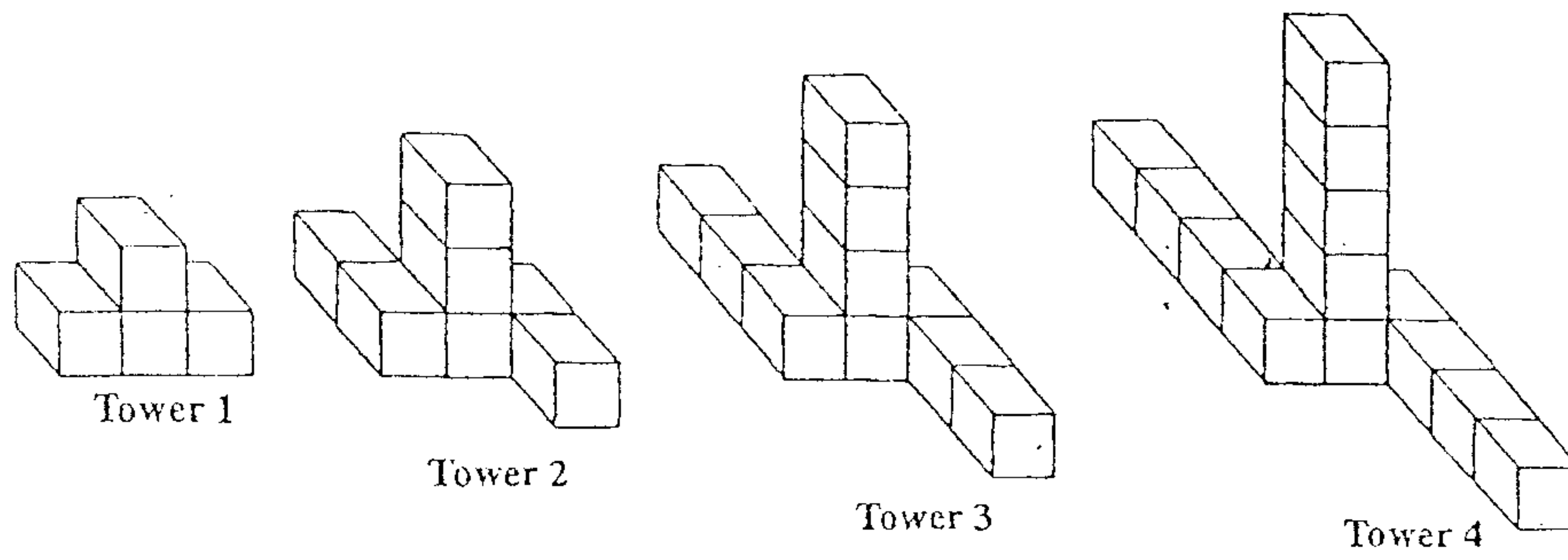
Answer: (a) _____ [1]

(b) _____ [2]

12. Given that $x - y = \frac{xy}{a - b}$, find the value of x when $y = 2$, $a = 5$ and $b = 6$.

Answer: $x =$ _____ [3]

13. A series of towers made out of 1-cm cubes are shown below.



- (a) Find the height of Tower 2345.
 (b) Find the number of 1-cm cubes needed to build Tower 800.

Answer: (a) _____ [1]

(b) _____ [2]

14. Simplify the following.

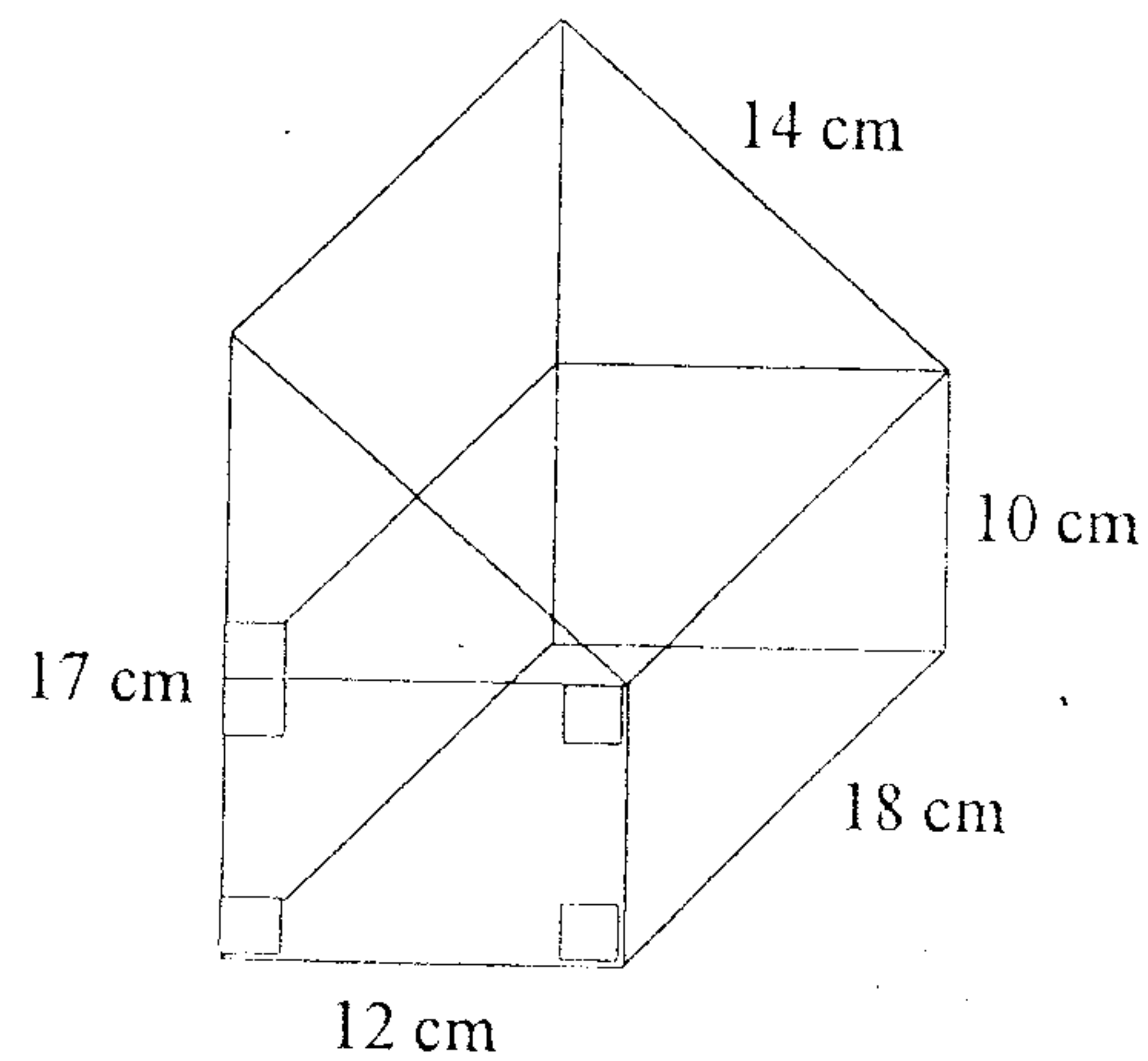
(a) $18a^2b^3 \div 12ab^2 \times \frac{a^2b}{3}$

(b) $\frac{7x-5}{6} - \frac{3(x-2)}{4}$

Answer: (a) _____ [2]

(b) _____ [3]

15.



The figure shows a block of solid comprising of a cuboid and a prism. The combined height of the figure is 17 cm and the dimensions of the other sides are as shown.

- (a) Calculate the volume of the block of solid.
 (b) If 10 ml of paint is needed to paint 1 cm² of the solid, and 1 l of paint costs \$12.50, find the cost needed in order to paint the solid.

Answer: (a) _____ cm³ [2]

(b) \$ _____ [4]

End-of-Paper



Anglo-Chinese School
(Barker Road)

MID-YEAR EXAMINATION 2007
SECONDARY 1 (EXPRESS)

MATHEMATICS

Part 2

TIME: 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Answer *all* questions.

Start each question on a fresh page.

Show your answers and working on the writing papers provided.

Omission of essential working will result in loss of marks.

INFORMATION FOR CANDIDATES

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

The total marks of this paper is 50.

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

You may use mathematical tables as well if necessary.

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. Give answers in degrees to one decimal place.

This question paper consists of 6 printed pages.

1. The product of two consecutive even numbers is 12 more than the square of the smaller number. Find the numbers. [2]

2. Alice, Cheryl and Yvonne were each given a piece of ribbon of equal length. Alice cut hers into equal lengths of 24 cm; Cheryl cut hers into equal lengths of 18 cm; and Yvonne cut hers into equal lengths of 15 cm. If there were no remainder in each case, find the shortest length of ribbon given to each of them. [2]

3. Evaluate the following using a calculator.

(a) $\frac{328 \div [12 - (12 - 53)] + 4}{3 \times \frac{4}{9}}$, correct to 3 significant figures. [1]

(b) $\frac{8.5^3 + 60 - \sqrt[3]{2345}}{\sqrt{136 \times 8}}$, correct to 3 significant figures. [2]

4. Solve the following equations.

(a) $7(x + 3) - (4x - 5) = 5 - (3x + 6)$ [3]

(b) $\frac{12y - 4}{6} = \frac{7y - 4}{5}$ [2]

5. (a) The HCF of two numbers is 1 and the LCM of these numbers is 91.
What are the numbers? [2]

- (b) The product of the ages of a group of teenagers (13 – 19 years old) is 4590 years.

Find

- (i) the number of teenagers in the group, [2]

- (ii) the sum of their ages. [2]

6. There are some marbles in a box. $\frac{1}{4}$ of the marbles are red. There are half as many yellow marbles as red ones. The rest are green.

(a) What is the fraction of green marbles?

[2]

(b) If there are 66 more green marbles than red marbles, how many marbles are there in a box?

[2]

7. Diagram 1 shows a 3×3 square. Eight squares which border the diagram are shaded and the centre square has been left blank.

Diagram 2 shows a 4×4 square. Twelve squares which border the diagram are shaded and the centre four squares have been left blank.

Diagram 3 shows a 5×5 square. Sixteen squares which border the diagram are shaded and the centre nine squares have been left blank.

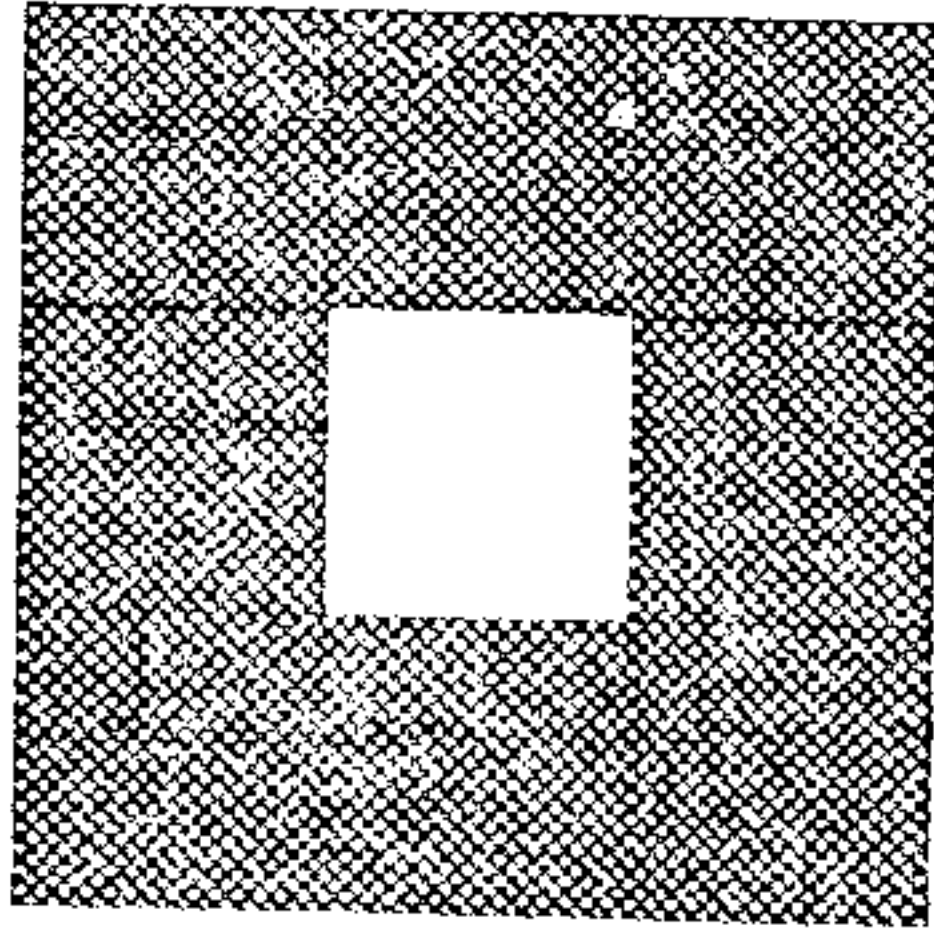


Diagram 1

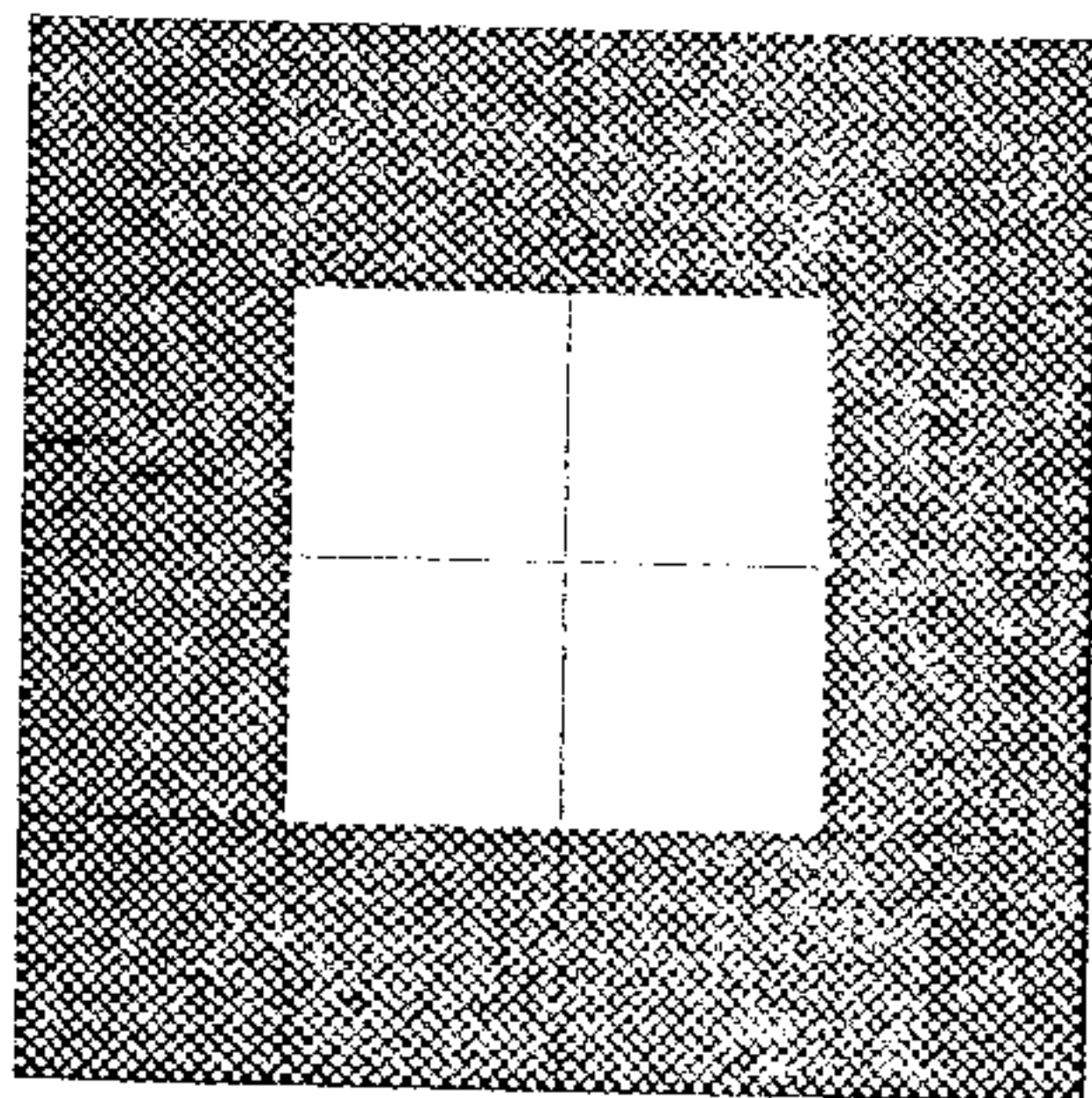


Diagram 2

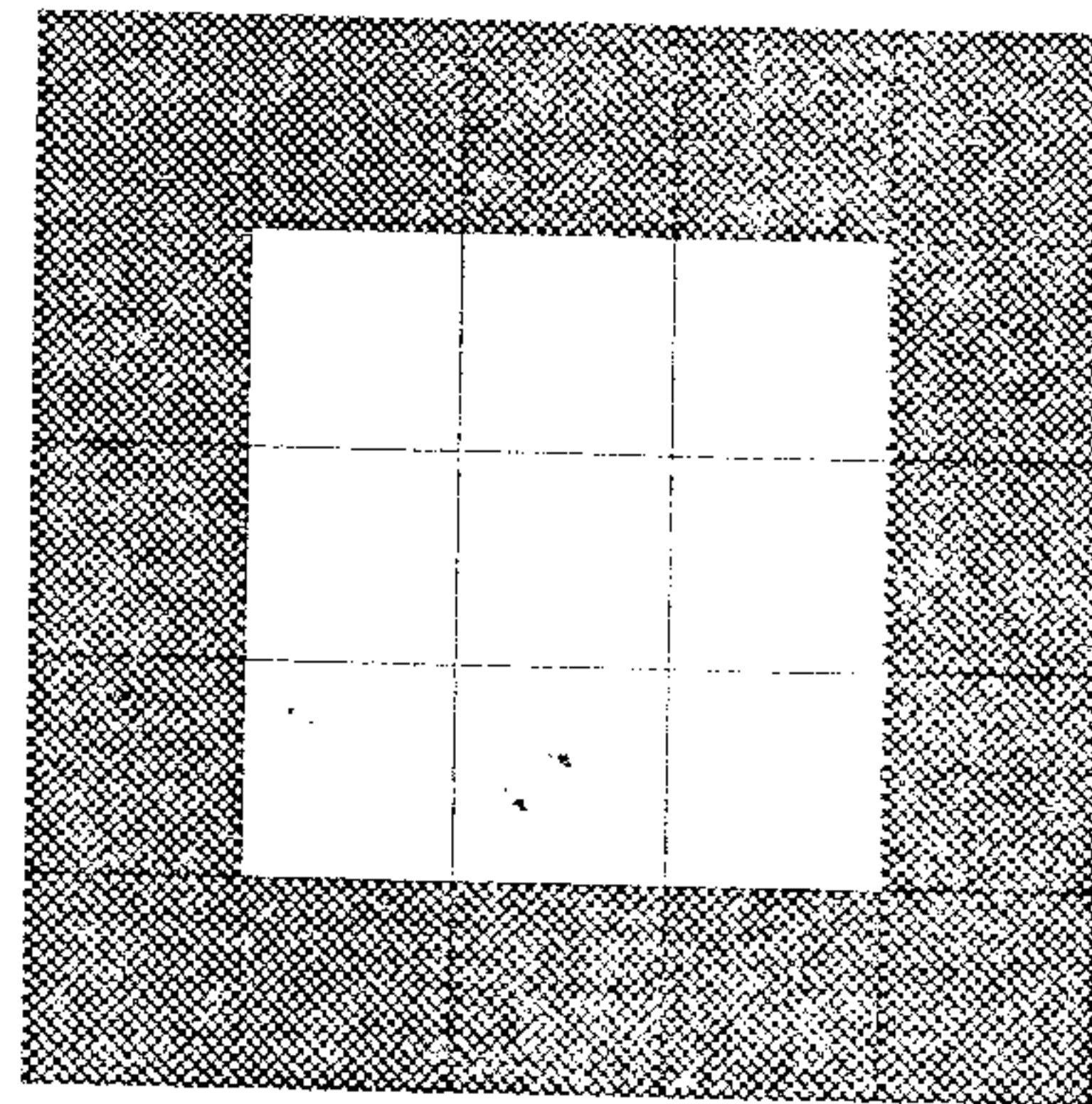


Diagram 3

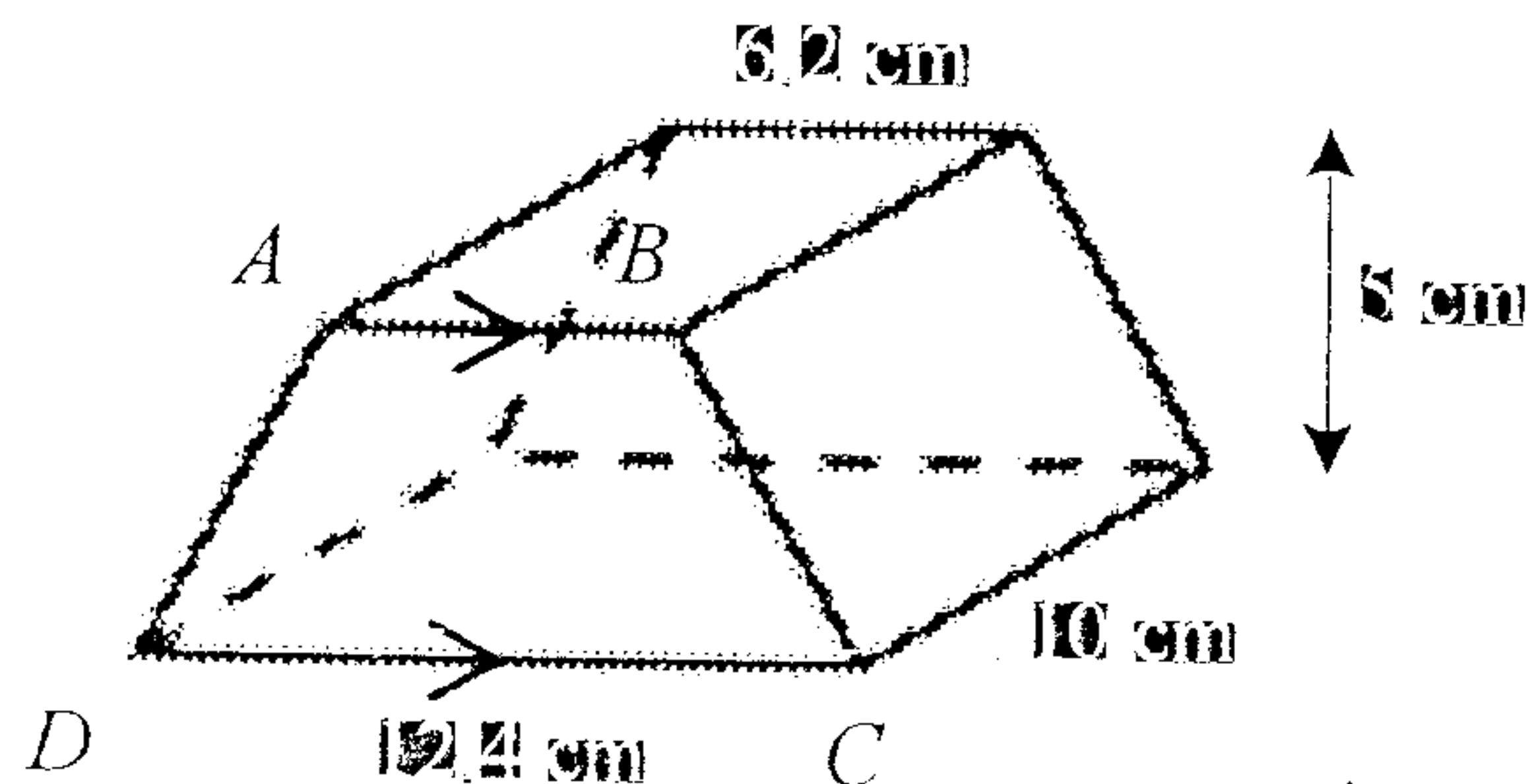
(a) Draw Diagram 5.

[2]

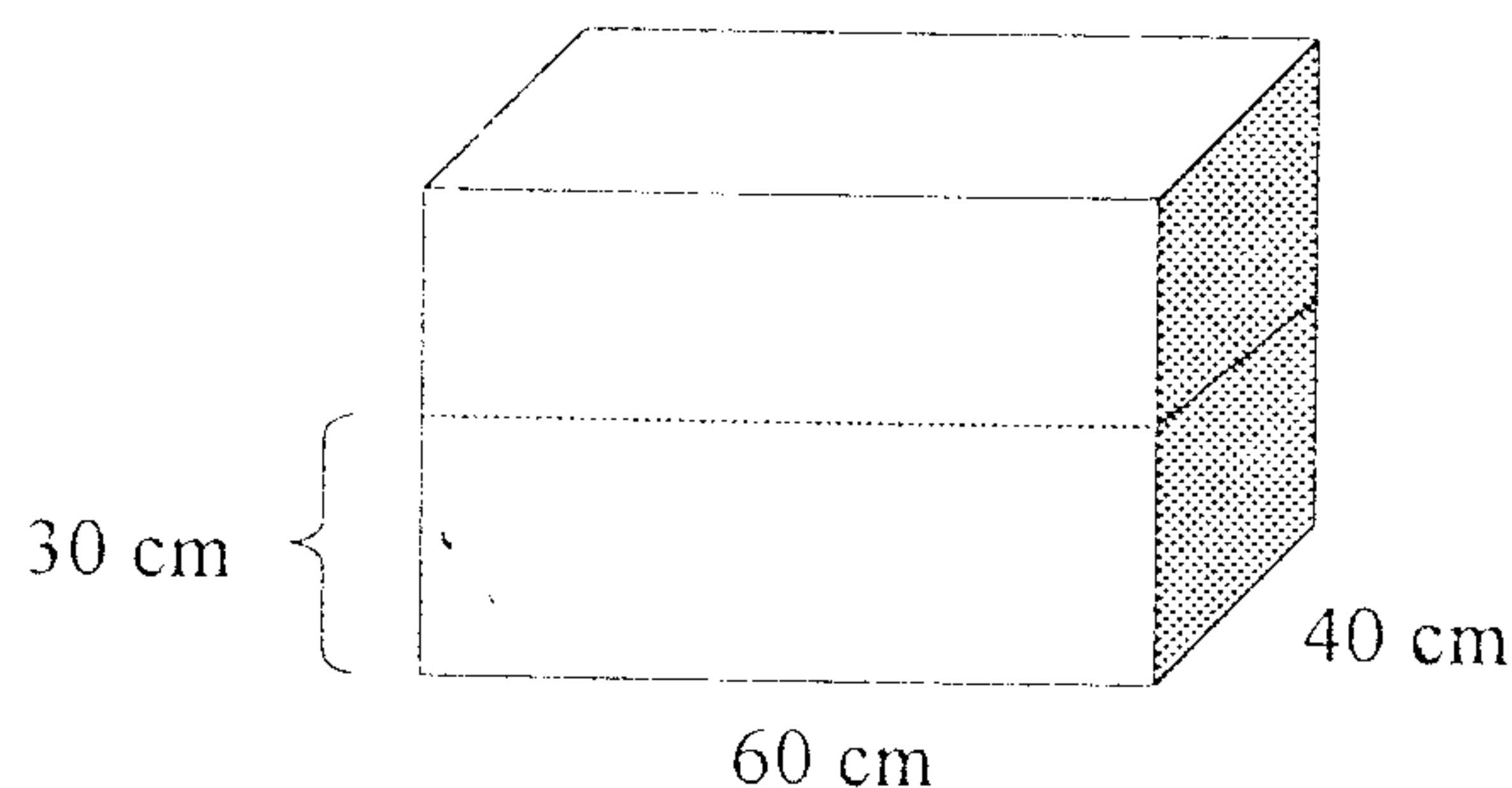
(b) How many centre squares will Diagram 9 have?

[2]

8. The diagram below shows a solid model.



- (a) Name the quadrilateral $ABCD$. [1]
- (b) Find the volume of the model in cm^3 . [2]
- (c) The model is made with a substance which has a density of 5.6 g/cm^3 . Calculate [Mass = Density \times Volume]
- (i) the mass of the model in kg, [1]
- (ii) the cost of producing a model when the substance cost \$2 per kg. [2]
9. A rectangular water tank of length 60 cm and width 40 cm contains water to a depth of 30 cm. A piece of ice 20 cm by 15 cm by 12 cm is put into the tank of water. When the ice melts completely, its volume decreases by $\frac{1}{10}$.



- (a) Calculate the volume of the ice when it melts completely. [2]
- (b) Calculate the total volume of water in the tank after the ice melts. [2]
- (c) Calculate the new depth of water in the tank. [1]

10. Colin bought a brand new car. He used \$10 500 to pay for the deposit and administrative charges, which amount to 15% of the car's price.

- (a) What is the price of the car? [2]
- (b) Having paid the deposit and administrative charges, Colin decided to borrow the rest of the money from a bank. If he is willing to repay the bank only \$850 per month, how long in terms of years will he take to repay the bank? Correct your answer to 2 significant figures. [3]
- (c) When he has paid up the full amount of the car after several years, Colin decided to sell his car for \$45 000. What is the percentage of loss for him? Correct your answer to 1 decimal place. [2]

11. (a) Given the sequence 18, 13, 8, x , -2 , y , find

- (i) the values of x and y , [2]
- (ii) the value of $x^2 + y^2$. [1]

(b) Study the following number pattern.

$$1 = 1 = \frac{1 \times (1+1)}{2}$$

$$1 + 2 = 3 = \frac{2 \times (2+1)}{2}$$

$$1 + 2 + 3 = 6 = \frac{3 \times (3+1)}{2}$$

$$1 + 2 + 3 + 4 = 10 = \frac{4 \times (4+1)}{2}$$

⋮

$$1 + 2 + 3 + 4 + \dots + k = 36 = \frac{k \times (k+1)}{2}$$

- (i) Write down the 10th line in the pattern. [1]
- (ii) Find the value of k . [2]

- End of Paper -

MID-YEAR EXAMINATION 2007

Secondary One Express

Mathematics Part 1 Answer

1. $3x^2 - 7xy$
2. (a) $3(x + 5)$
(b) $(6h + 5)(x - 2y)$
3. (a) -1.4
(b) 4.32
4. (a) 7, 9, 1
(b) 7
(c) $\sqrt{3}, \pi, \sqrt{2^2 + 3^2}$
5. (a) 123.50
(b) 120
(c) 120
6. (a) 6
(b) $p = 25$ or 75
7. (a) 90°C
(b) 18.5°C
8. 48

9. (a) $3\frac{6}{11}$

(b) 3.54

10. (a) $24 - 6x$

(b) $7(1 - x)$

11. (a) $m = 4$

(b) $n = 5$

12. $x = \frac{2}{3}$

13. (a) 2346

(b) 2401

14. (a) $\frac{a^3b^2}{2}$

(b) $\frac{5x+8}{12}$

15. (a) 2916 cm^3

(b) \$ 159.75

MID-YEAR EXAMINATION 2007
Secondary one express
Mathematics Part 2 Answer

1. 6 and 8
2. LCM = 360
- 3a. 7.64
- 3b. 20.0
- 4a. $-\frac{9}{2}$ or $-4\frac{1}{2}$
- 4b. $-\frac{2}{9}$
- 5a. 1 and 91 or 7 and 13
- 5b(i). $2 \times 3 \times 3 = 18$
 $3 \times 5 = 15$
- 5b(ii) 50
- 6a. $\frac{5}{8}$
- 6b. 176
- 7a. Diagram 5
- 7b. 81
- 8a. trapezium
- 8b. 465cm^3
- 8c(i) 2.604kg
- 8c(ii) \$5.208 or \$5.21
- 9a. 3240cm^3

9b. 75240cm^3

9c. 31.35cm

10a. $\$70\ 000$

10b. 5.8years

10c. 35.7%

11a(i). -7

11a(ii). 58

11b(i). $\frac{10(10+1)}{2}$

11b(ii) $k = 8$