Scholarship Paper

Subject: Mathematics Paper II
Paper:
Time: 1 Hour

You must have:
Pen, Calculator, Ruler
Pencil

Total Marks
69

Instructions

An answer booklet is provided inside this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for a continuation booklet.

- Answer **ALL** questions.
- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.

Information

- The total mark for this paper is **69**
- The marks for **each** question are shown in brackets
    - *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Write your answers neatly and in good English.

Questions

Q1.

(a) Simplify n^0

(1)

(b) Simplify $(3x^2y^5)^3$

(2)

(c) Factorise fully $2e^2 - 18$

(2)

(d) Make r the subject of $m = \sqrt{\dfrac{6a + r}{5r}}$

(4)

(Total for question = 9 marks)

Q2.

Express $\dfrac{5}{3} - \dfrac{x+2}{2x}$ as a single fraction in its simplest terms.
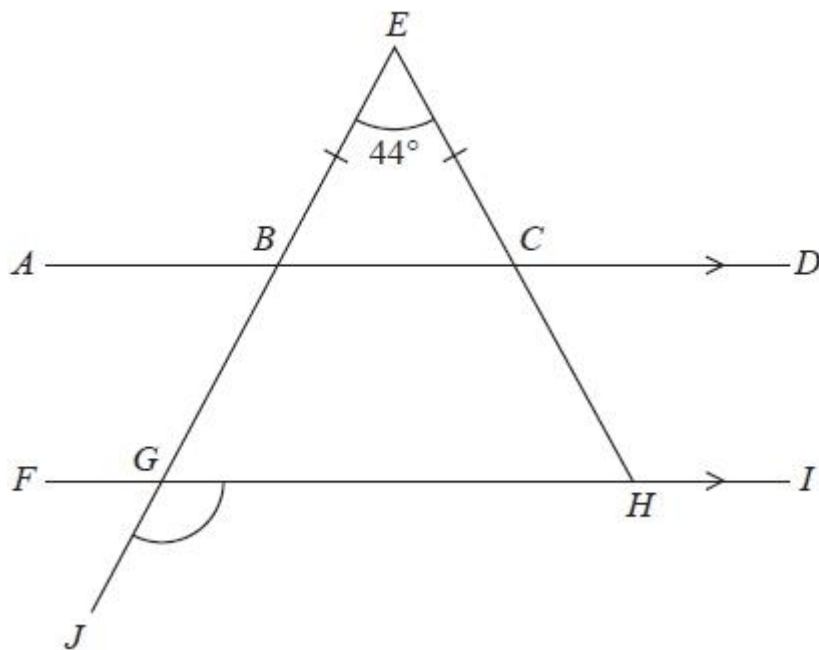
(Total for question = 3 marks)
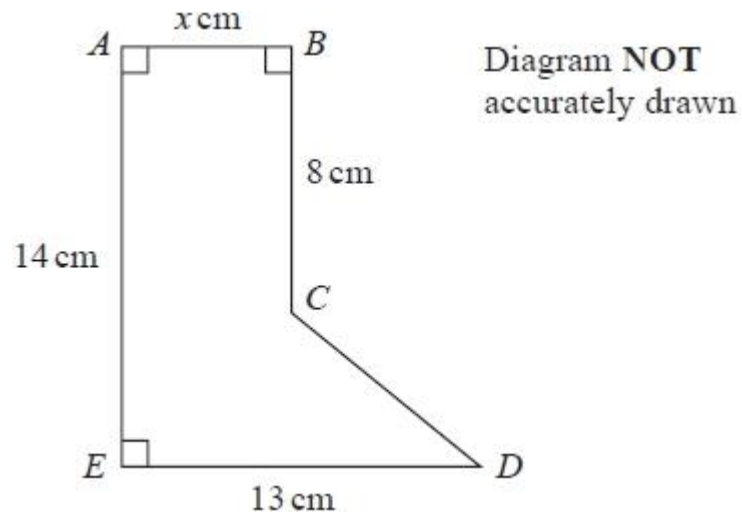
Q3.

Diagram **NOT** accurately drawn

ABCD and *FGHI* are parallel straight lines.
EBGJ and *ECH* are straight lines.

BE = CE
Angle *BEC* = 44°

Work out the size of angle *JGH*.
Give a reason for each stage of your working.

.... °

(Total for question = 5 marks)

Q4.

x cm

A ⌐ ⌐ B

Diagram **NOT**
accurately drawn

8 cm

14 cm

C

E ⌐ D

13 cm

The diagram shows the shape *ABCDE*.

The area of the shape is 91.8 cm^2

Work out the value of *x*.

x = ...

(Total for question = 4 marks)

Q5.

The diagram shows a sector of a circle with radius 7 cm.

7 cm

50°

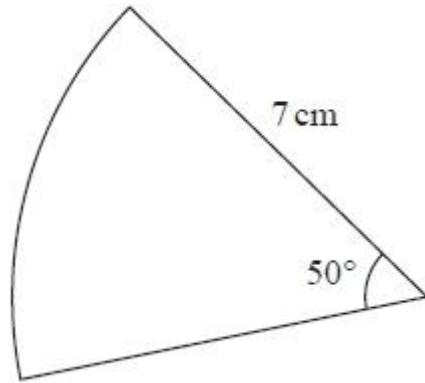Diagram **NOT** accurately drawn

Work out the length of the arc of the sector.
Give your answer correct to one decimal place.

.... cm

(Total for question = 2 marks)

Q6.

$(2x + 23)$, $(8x + 2)$ and $(20x – 52)$ are three consecutive terms of an arithmetic sequence.

Prove that the common difference of the sequence is 12

(Total for question = 4 marks)

Q7.

Jethro has sat 5 tests.
Each test was marked out of 100 and Jethro's mean mark for the 5 tests is 74

Jethro has to sit one more test that is also to be marked out of 100

Jethro wants his mean mark for all 6 tests to be at least 77

Work out the least mark that Jethro needs to get for the last test.

....

(Total for question = 3 marks)

Q8.

Chao bought a boat for HK$160 000
The value of the boat depreciates by 4% each year.

(a) Work out the value of the boat at the end of 3 years.

Give your answer correct to the nearest HK$.

HK$ ....

(3)

Jalina gets a salary increase of 5%
Her salary after the increase is HK$252 000

(b) Work out Jalina's salary before the increase.

HK$ ....
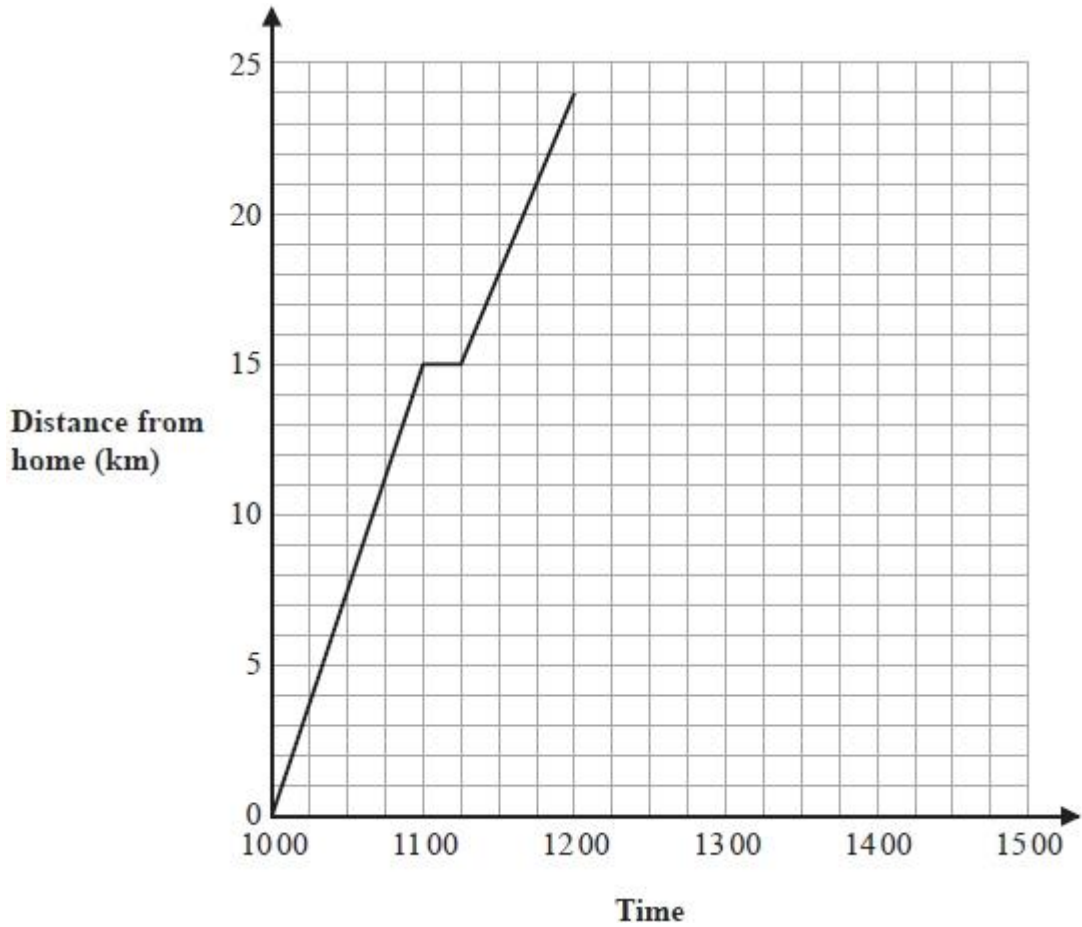
(3)

(Total for question = 6 marks)

Q9.

(2)

Jalina left her home at 10 00 to cycle to a park.
On her way to the park, she stopped at a friend's house and then continued her journey to the park.
Here is the distance-time graph for her journey to the park.

(a) On her journey to the park, did Jalina cycle at a faster speed before or after she stopped at her friend's house?

Give a reason for your answer.

....

....

.... **(1)**

Jalina stayed at the park for 45 minutes.
She then cycled, without stopping, at a constant speed of 16 km/h from the park back to her home.

(b) Show all this information on the distance-time graph.

(2)

(c) Work out Jalina's average cycling speed, in kilometres per hour, for the complete journey to the park and back.

Do **not** include the times when she was not cycling in your calculation.
Give your answer correct to 1 decimal place.

.... km/h

(3)

(Total for question = 6 marks)

Q10.

Work out the difference between the largest share and the smallest share when 3450 yen is divided in the ratios 2 : 6 : 7

.... yen

(Total for question = 3 marks)

Q11.

Show that $2\dfrac{4}{7} \div 1\dfrac{1}{8} = 2\dfrac{2}{7}$

(Total for question = 3 marks)

Q12.

(a) Factorise fully $15y^4 + 20uy^3$

....

(2)

(b) Solve $4 - 3x = \dfrac{5 - 8x}{4}$

Show clear algebraic working.

$x =$ ....

(3)

(Total for question = 5 marks)

Q13.

Show that $4\dfrac{2}{3} \div 1\dfrac{1}{9} = 4\dfrac{1}{5}$

(Total for question = 3 marks)

Q14.

(a) Find the highest common factor (HCF) of 96 and 120

(2)

$A = 2^3 \times 5 \times 7^2 \times 11$
$B = 2^4 \times 7 \times 11$
$C = 3 \times 5^2$

(b) Find the lowest common multiple (LCM) of A, B and C.

(2)

(Total for question = 4 marks)

Q15.
$-4 \leq 2y < 6$

y is an integer.
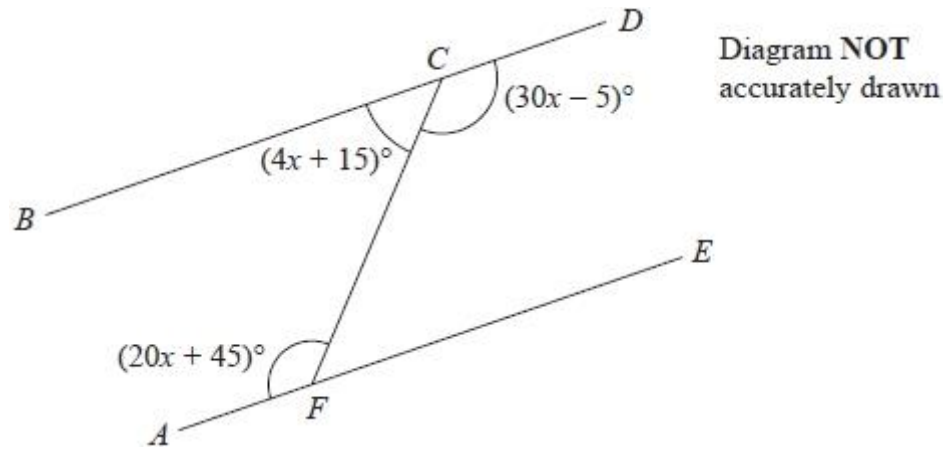
(a) Write down all the possible values of y.

....

(2)

(b) Solve the inequality $7t - 3 \leq 2t + 31$

Show your working clearly.

....

(2)

(Total for question = 4 marks)

Q16.

BCD and *AFE* are straight lines.

Show that *BCD* is parallel to *AFE*.
Give reasons for your working.

(Total for question = 5 marks)