聖 嬰 中 學

HOLY INNOCENTS' HIGH SCHOOL

Name of Student

Class

Index Number

25

WEIGHTED ASSESSMENT 3 2020
SECONDARY 2 EXPRESS
MATHEMATICS 4048

Duration: 40 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on all the work you hand in.
Write in dark blue or black pen.
You may use a 2B pencil for any diagrams or graphs.
Do not use paper clips, glue or correction tape/fluid.

Answer **ALL** questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
The use of an approved scientific calculator is expected, where appropriate.
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.
For π, use either your calculator value or 3.142.

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

The total marks for this paper is **25**.

For Examiner's use

You need to improve on your:
- PRESENTATION
- ACCURACY

Marks (max 5%)

Set by: Mr. Ian Sim

Vetted by: Mrs Chang Poh Joo

*This document consists of **9** printed pages (including cover page) and **1** blank page.*

Answer all the questions

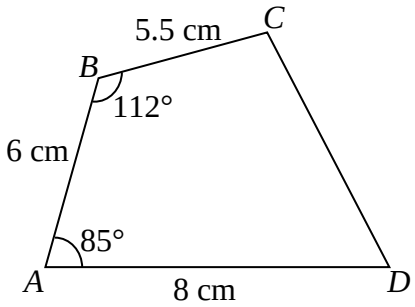
1 Solve the simultaneous equations

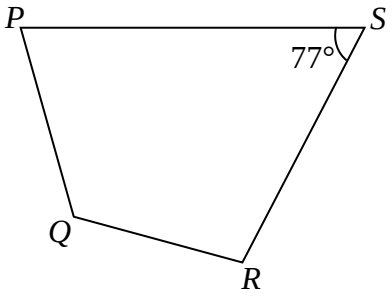
$$3x - 4y = 17,$$
$$2x + 6y = -6.$$

Answer $x =$ …… , $y =$ …… [3]

2 The quadrilateral *ABCD* is congruent to the quadrilateral *PQRS*.

AB = 6 cm, *BC* = 5.5 cm, *AD* = 8 cm, angle *BAD* = 85°, angle *ABC* = 112° and angle *PSR* = 77°.





Find

(a) the length of *QR*,

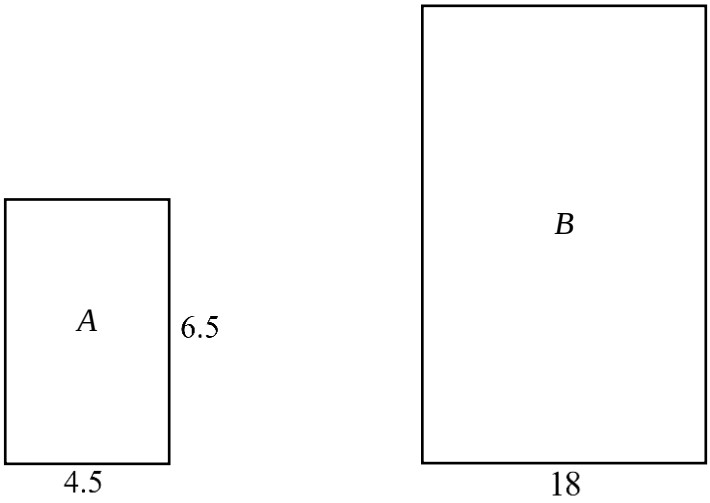
Answer ...…… cm [1]

(b) angle *BCD*.

Answer …… ° [2]

3 Rectangle *B* is an enlargement of rectangle *A*.

All measurements are in cm.



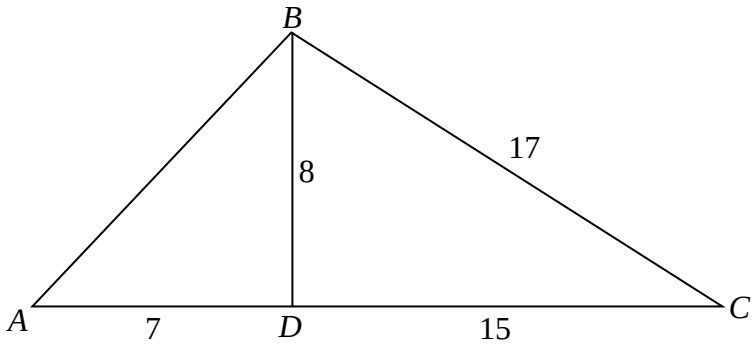
(a) Write down the scale factor of the enlargement.

Answer ……..…….... [1]

(b) Find the length of the unknown side of rectangle *B*.

Answer …… cm [1]

4



In the diagram, $AD = 7$ cm, $BD = 8$ cm, $CD = 15$ cm and $BC = 17$ cm.

(a) Show that triangle BCD is a right-angled triangle.

Answer ……..……...

……..……...

……..……

……..……...

……..……...

....……..…….. [2]

(b) Find the length of AB.

Answer …… cm [2]

5 The variables x and y are connected by the equation $y = x^2 - x - 6$.

Some corresponding values of x and y are given in the table below.

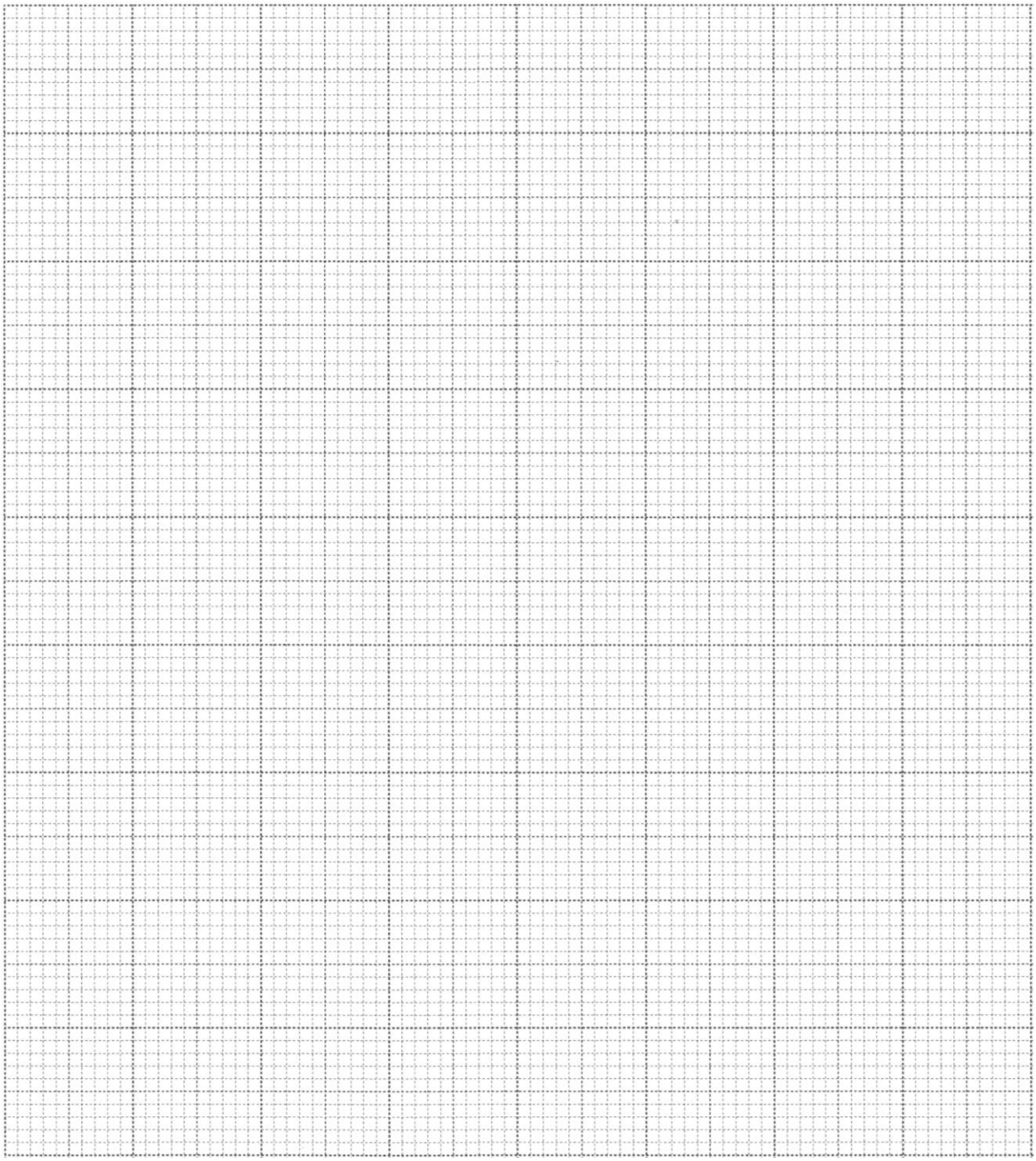
x	-3	-2	-1	0	1	2	3	4
y	6	0	-4	-6	-6	-4	0	6

(a) Draw the graph of $y = x^2 - x - 6$.

Using a scale of 2 cm to represent 1 unit, draw a horizontal x-axis for $-3 \leq x \leq 4$.

Using a scale of 1 cm to represent 1 unit, draw a vertical y-axis for $-8 \leq y \leq 6$.

On your axes, plot the points given in the table and join them with a smooth curve. [3]



(b) Use your graph to find

(i) the minimum value of y,

Answer ……..... [1]

(ii) the equation of the line of symmetry.

Answer ……..... [1]

6 A factory manufactures toy trains.

It takes x minutes to manufacture a toy train.

(a) Write down an expression, in terms of x, for the number toy trains that the factory can manufacture in an hour.

Answer ……..... [1]

(b) The factory also manufactures toy planes. It takes one minute longer for the factory to produce a toy plane. Write down an expression, in terms of x, for the number of toy planes that the factory can manufacture in an hour.

Answer ……..... [1]

(c) In an hour, the factory can manufacture 3 more toy trains than toy planes.

Write down an equation in x to represent this information and show that it reduces to

$$x^2 + x - 20 = 0 .$$

Answer ……...

……...

……...

……...

……...

……...

……...

……. [3]

(d) Solve the equation $x^2 + x - 20 = 0$.

Answer ……..... [2]

(e) Find the number of toy trains that the factory can manufacture in one hour.

Answer ……..... [1]

End of Paper