

Write your name here	
Surname	Other names
Pearson Edexcel	Centre Number
Level 1/Level 2 GCSE (9-1)	Candidate Number
Mathematics Paper 3 (Calculator) Aiming for 7 Higher Tier	
Spring 2022 Practice Paper Time: 1 hour 30 minutes	Paper Reference 1MA1/3H
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 80. There are 22 questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2019 examinations
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Simplify $n^3 \times n^5$

.....
(1)

(b) Simplify $\frac{c^3 d^4}{c^2 d}$

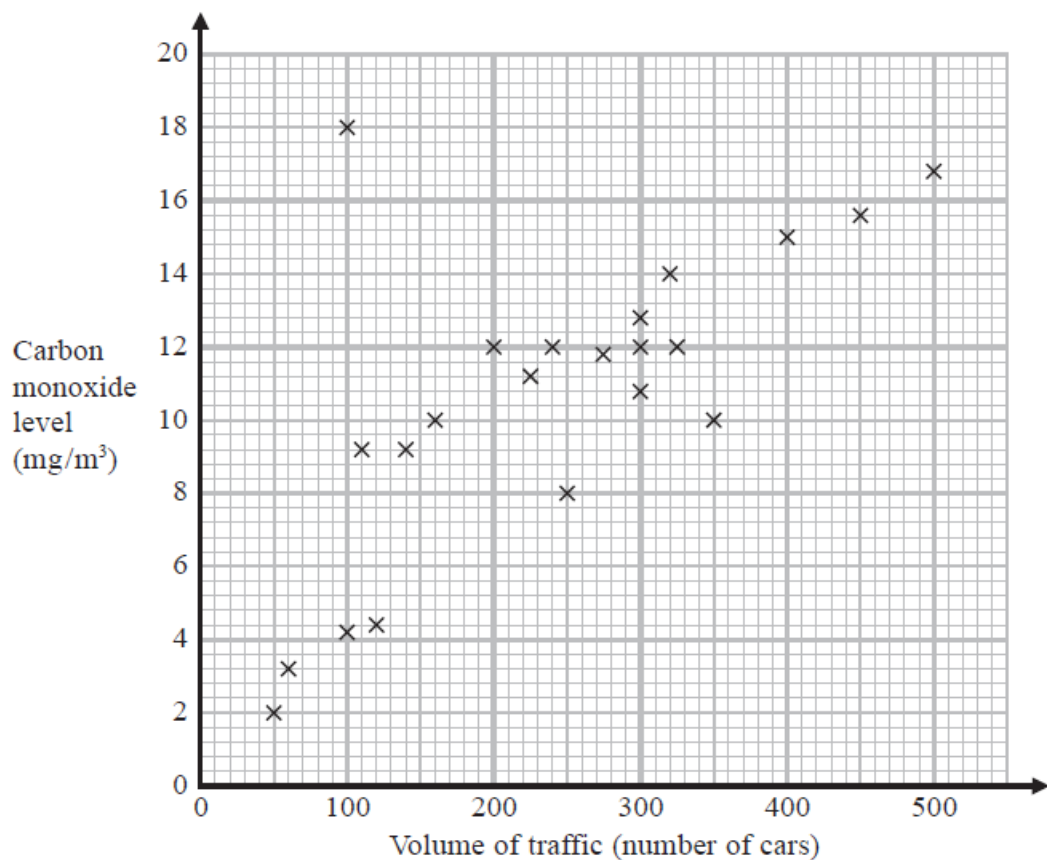
.....
(2)

(c) Solve $\frac{5x}{2} > 7$

.....
(2)

(Total for Question 1 is 5 marks)

- 2 The scatter graph shows information about the volume of traffic and the carbon monoxide level at a point on a road each day for 22 days.



One point is an outlier.

- (a) Write down the coordinates of this point.

(.....,)
(1)

For another day, 370 cars pass the point on the road.

- (b) Estimate the carbon monoxide level for this day.

..... mg/m³
(2)

Alfie says,

“Because there is an outlier, there is no correlation.”

(c) Is Alfie correct?

You must give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 2 is 4 marks)

3 (a) Write 4.5×10^5 as an ordinary number.

.....

(1)

(b) Write 0.007 in standard form.

.....

(1)

(c) Work out $4.2 \times 10^3 + 5.3 \times 10^2$
Give your answer in standard form.

.....

(2)

(Total for Question 3 is 4 marks)

- 4 There are some counters in a bag.
The counters are blue or green or red or yellow.

The table shows the probabilities that a counter taken at random from the bag will be blue or will be green.

Colour	blue	green	red	yellow
Probability	0.32	0.20		

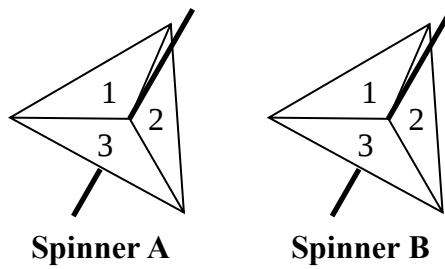
The probability that a counter taken at random from the bag will be red is five times the probability that the counter will be yellow.

There are 300 counters in the bag.

Work out the number of yellow counters in the bag.

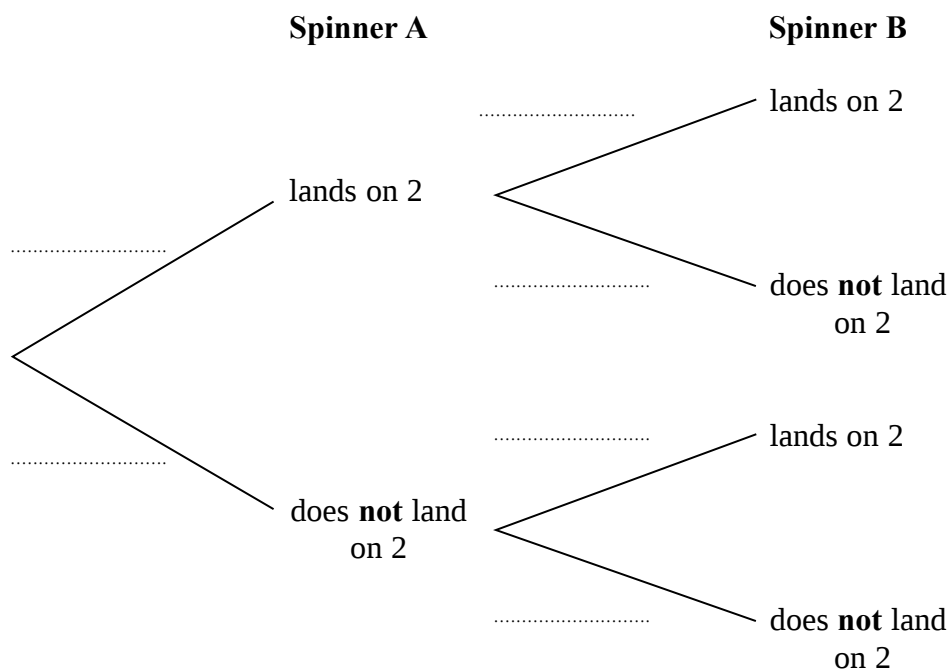
.....
(Total for Question 4 is 3 marks)

5 Amanda has two fair 3-sided spinners.



Amanda spins each spinner once.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Spinner A lands on 2 and Spinner B does **not** land on 2

.....
(2)

(Total for Question 5 is 4 marks)

- 6 Andy cycles a distance of 30 km at an average speed of 24 km/h.
He then runs a distance of 12 km at an average speed of 8 km/h.

Work out the total time Andy takes.
Give your answer in hours and minutes.

..... hours minutes

(Total for Question 6 is 3 marks)

- 7 A number, m , is rounded to 1 decimal place.
The result is 9.4

Complete the error interval for m .

..... $\leq m <$

(Total for Question 7 is 2 marks)

- 8 In a bag there are only red counters, blue counters, green counters and pink counters. A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15		

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

- (a) Complete the table.

(2)

There are 18 blue counters in the bag.

- (b) Work out the total number of counters in the bag.

.....
(2)
(Total for Question 8 is 4 marks)

- 9** Maisie knows that she needs 3 kg of grass seed to make a rectangular lawn 5 m by 9 m.

Grass seed is sold in 2 kg boxes.

Maisie wants to make a rectangular lawn 10 m by 14 m.

She has 5 boxes of grass seed.

- (a) Has Maisie got enough grass seed to make a lawn 10 m by 14 m?

You must show all your working.

(4)

Maisie opens the 5 boxes of grass seed.

She finds that 4 of the boxes contain 2 kg of grass seed.

The other box contains 1 kg of grass seed.

- (b) Does this affect whether Maisie has enough grass seed to make her lawn?

Give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 9 is 5 marks)

10 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

weight of potato : weight of cheese : weight of onion = 9 : 2 : 1

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

£.....
(Total for Question 10 is 4 marks)

- 11** A water tank is empty.
Anil needs to fill the tank with 2400 litres of water.

Company **A** supplies water at a rate of 8 litres in 1 minute 40 seconds.
Company **B** supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company **A** would take more time to fill the tank than Company **B** would take to fill the tank.

How much more time?
Give your answer in minutes correct to the nearest minute.

..... minutes
(Total for Question 11 is 4 marks)

- 12** A person's heart beats approximately 10^5 times each day.
A person lives for approximately 81 years.
- (a) Work out an estimate for the number of times a person's heart beats in their lifetime.
Give your answer in standard form correct to 2 significant figures.

.....
(2)

2×10^{12} red blood cells have a total mass of 90 grams.

- (b) Work out the average mass of 1 red blood cell.
Give your answer in standard form.

..... grams
(2)

(Total for Question 12 is 4 marks)

13 Freya writes down the value of x , correct to 1 decimal place.

She writes $x = 6.4$

Complete the error interval for x .

..... $\leq x <$
(Total for Question 13 is 2 marks)

14 There is a total of 45 boys and girls in a choir.

The mean age of the 18 boys is 16.2 years.

The mean age of the 27 girls is 16.7 years.

Calculate the mean age of all 45 boys and girls.

..... years
(Total for Question 14 is 3 marks)

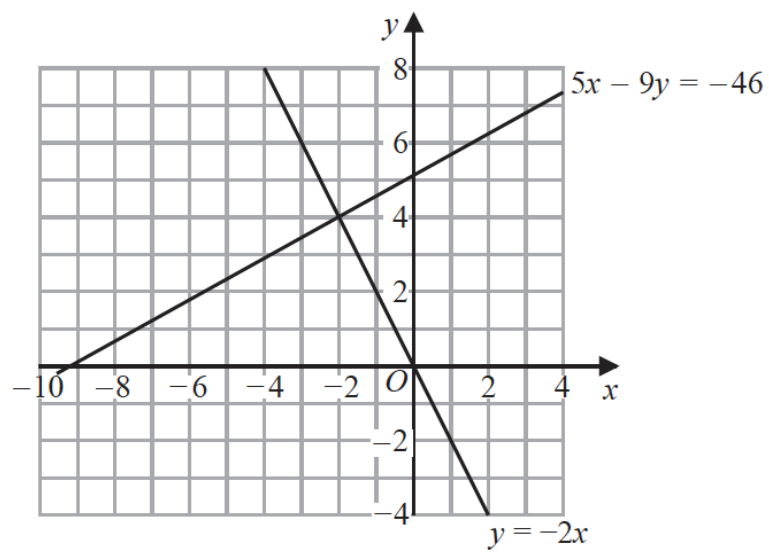
- 15 (a) Express $\frac{x}{x+2} + \frac{2x}{x-4}$ as a single fraction in its simplest form.

.....
(3)

- (b) Expand and simplify $(x-3)(2x+3)(4x+5)$

.....
(3)

(Total for Question 15 is 6 marks)



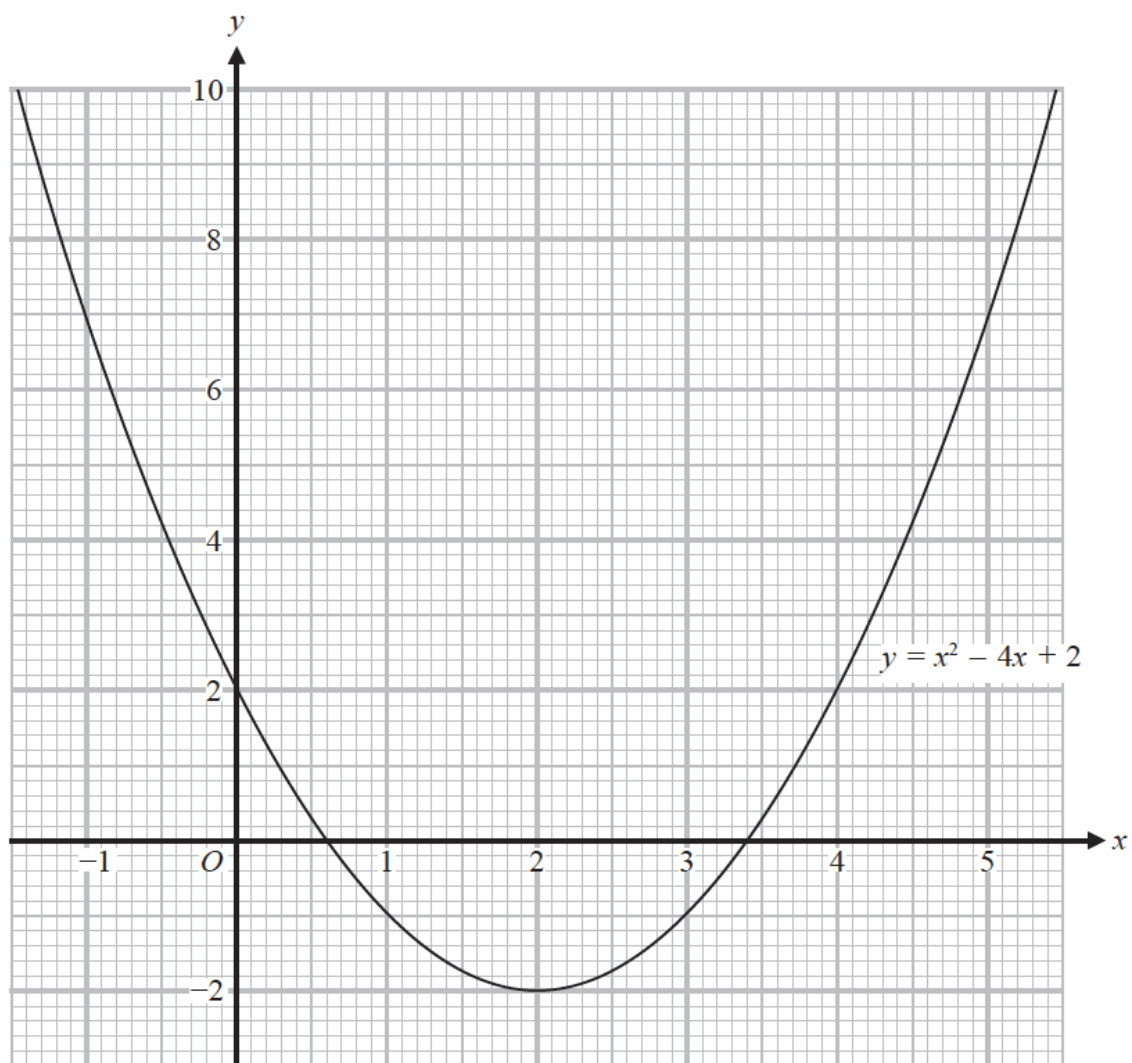
(a) Use these graphs to solve the simultaneous equations

$$\begin{aligned} 5x - 9y &= -46 \\ y &= -2x \end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(1)

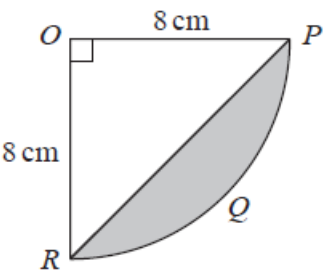


(b) Use this graph to find estimates for the solutions of the quadratic equation $x^2 - 4x + 2 = 0$

.....
(2)

(Total for Question 16 is 3 marks)

17 The diagram shows a sector $OPQR$ of a circle, centre O and radius 8 cm.



OPR is a triangle.

Work out the area of the shaded segment PQR .
Give your answer correct to 3 significant figures.

..... cm^2
(Total for Question 17 is 4 marks)

18 On Monday, 12 people took 5 hours to clean a number of cars.
On Tuesday, 15 people cleaned the same number of cars.

Assuming that all the people worked at the same rate,

(a) work out how many hours the 15 people took to clean the cars.

..... hours
(2)

The assumption is wrong.

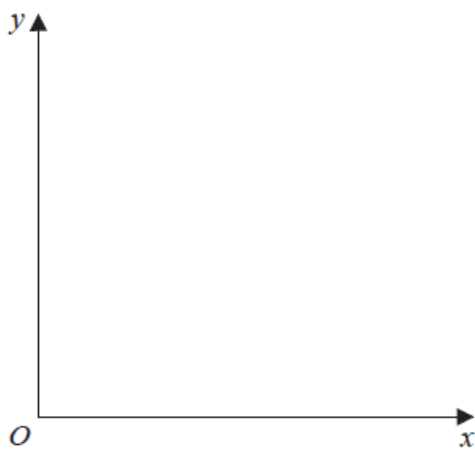
(b) How might this affect the time taken for the 15 people to clean the cars?

.....
.....
.....
(1)

(Total for Question 18 is 3 marks)

- 19** (a) Using the axes below, sketch a graph to represent the statement

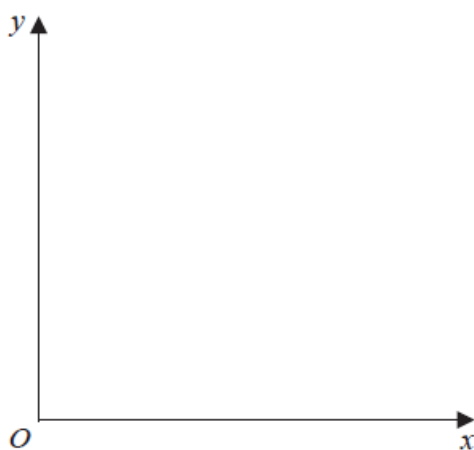
y is directly proportional to x



(1)

- (b) Using the axes below, sketch a graph to represent the statement

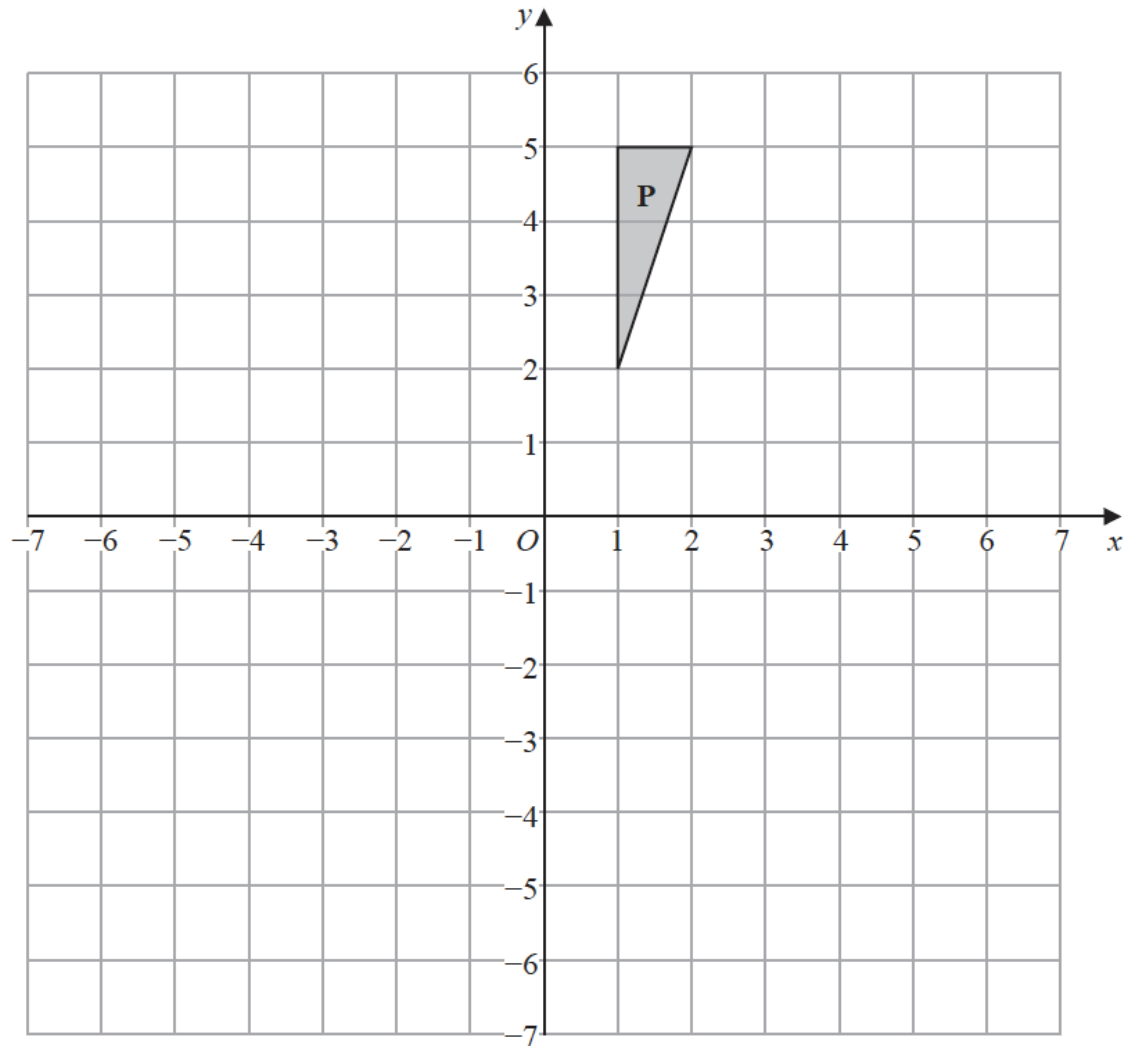
y is inversely proportional to x



(1)

(Total for Question 19 is 2 marks)

20 The diagram shows a triangle **P** on a grid.



Triangle **P** is rotated 180° about (0, 0) to give triangle **Q**.

Triangle **Q** is translated by $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ to give triangle **R**.

(a) Describe fully the single transformation that maps triangle **P** onto triangle **R**.

.....

 (3)

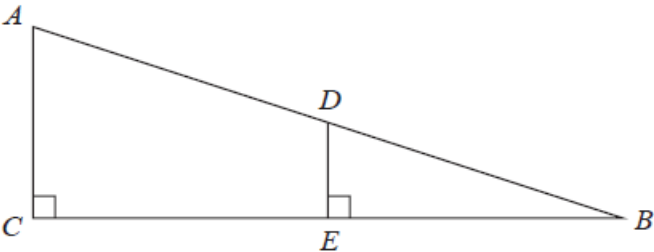
Under the transformation that maps triangle **P** onto triangle **R**, the point **A** is invariant.

(b) Write down the coordinates of point **A**.

(..... ,)
 (1)

(Total for Question 20 is 4 marks)

21 The diagram shows two right-angled triangles ACB and DEB .



- $AD = 9\text{ cm}$
- $DE = 2\text{ cm}$
- $DB = 6\text{ cm}$

Calculate the length of CB .
Give your answer correct to 2 decimal places.

..... cm

(Total for Question 21 is 4 marks)

22 The first four terms of a Fibonacci sequence are

$$a \quad 2a \quad 3a \quad 5a$$

The sum of the first five terms of this sequence is 228

Work out the value of a .

.....
(Total for Question 22 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS