Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Tuesday 7 January 2020

Morning (Time: 2 hours) | Paper Reference **4MA1/1F**

Mathematics A

Paper 1F

Foundation Tier

You must have:
Ruler graduated in centimetres and millimetres, protractor, 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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/1/

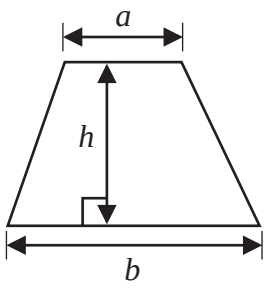
P 5 9 7 5 2 A 0 1 2 4

Pearson

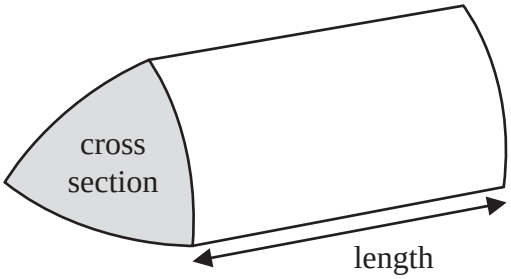
International GCSE Mathematics

Formulae sheet – Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

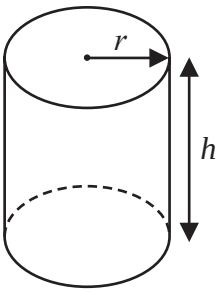


Volume of prism = area of cross section × length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Answer all TWENTY TWO questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows the land area, in km^2, of each of six African countries.

Country	Land area (km^2)
Botswana	566 730
Kenya	569 140
Namibia	823 290
Somalia	627 340
Tanzania	885 800
Zambia	743 390

(a) Write down the name of the country with the greatest land area.

Tanzania (1)

.....

(1)

(b) Write 823 290 correct to the nearest thousand.

less than 5. We round down to 0

823 000 (1)

.....

(1)

(c) Work out the difference between the land area of Botswana and the land area of Kenya.

569 140 - 566 730

= 2410 (1)

2410 km^2

.....

(1)

The land area of the Gambia is 10 120 km^2

(d) Write the number 10 120 in words.

Ten thousand one hundred and twenty. (1)

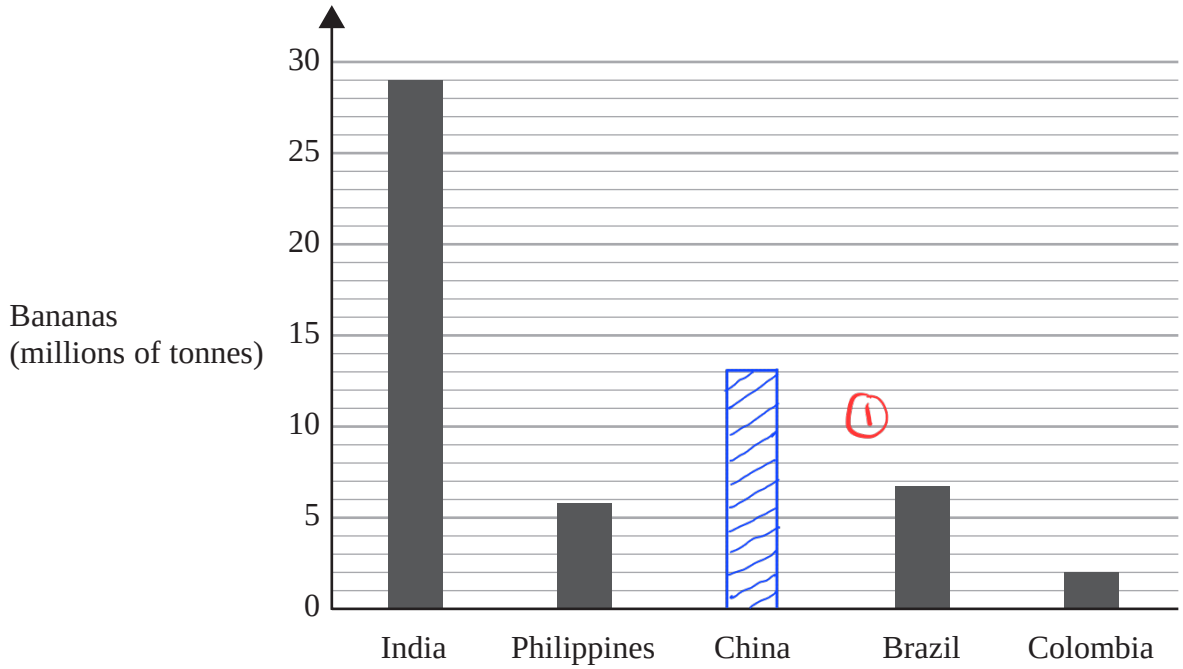
.....

.....

(1)

(Total for Question 1 is 4 marks)

2 The bar chart shows information about the weight, in millions of tonnes, of bananas produced by each of four countries in 2016



In 2016, China produced 13 million tonnes of bananas.

(a) Draw a bar on the bar chart to show this information.

(1)

One of these countries produced 6.8 million tonnes of bananas in 2016

(b) Which country?

Brazil (1)

(1)

In 2016, a total of 113 million tonnes of bananas was produced worldwide.

(c) What fraction of the 113 million tonnes of bananas was produced in India in 2016?

India : 29 million tonnes (1)

$\frac{29}{113}$ (1)

$\frac{29}{113}$

(2)

(Total for Question 2 is 4 marks)

3 (a) Complete the following sentences by writing a sensible metric unit on each of the dotted lines.

(i) The distance from Cairo to Nairobi is 5211 ..... kilometres (km) ①

(ii) The weight of an egg is 20 ..... grams (g) ① .....

(iii) The area of the floor of a classroom is 260 ..... square metres (m^2) ①

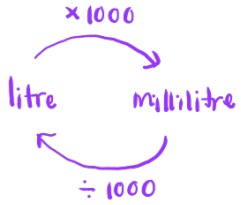
(3)

Cara has a bottle of juice.
There is 1 litre of juice in the bottle.

Cara makes some drinks.
She uses exactly 30 millilitres of this juice to make each drink.

Cara makes as many drinks as possible.

(b) How many drinks does Cara make?



1 litre × 1000 = 1000 ml (convert ℓ to mℓ) ①

$\frac{1000}{30}$ = 33.3 ①

= 33 (convert to nearest whole number)

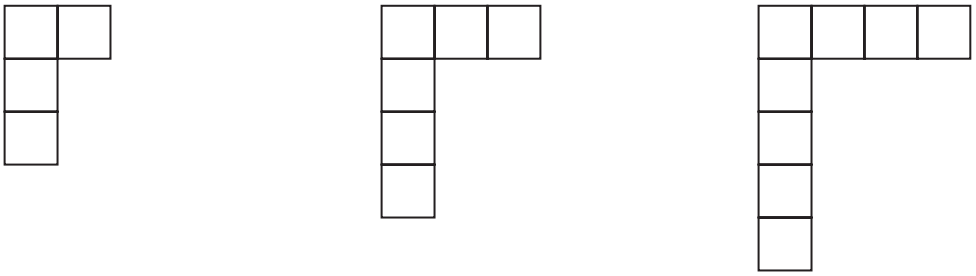
∴ Cara can make 33 drinks. ①

33

(3)

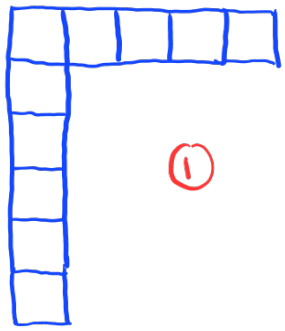
(Total for Question 3 is 6 marks)

4 Here is a sequence of patterns made from square tiles.



Pattern number 1 Pattern number 2 Pattern number 3

(a) In the space below, draw Pattern number 4



(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of tiles	4	6	8	10	12

(1)

(c) Work out the number of tiles in Pattern number 30

$2n + 2$

$2(30) + 2$ (1)

$60 + 2$

$= 62$ (1)

62

(2)

Liz says that in Pattern number n, the number of tiles is $2n$.

(d) Is Liz correct?
You must give a reason for your answer.

$2n = 4 + (n-1)(2)$

$= 4 + 2n - 2$

$2n \neq 2n + 2$

No. Because in pattern number n, the pattern number will always be $2n + 2$. (1)

(1)

(Total for Question 4 is 5 marks)

5 Paul is buying a sandwich and a drink in a meal deal.

He can have a cheese sandwich (C) or an egg sandwich (E) or a tomato sandwich (T).
He can have orange juice (O) or milk (M) or water (W) to drink.

Write down all the possible combinations Paul can buy.

CO, CM, CW, EO, EM, EW, TO, TM, TW. (2)

(Total for Question 5 is 2 marks)

6 (a) Write $\frac{1}{4}$ as a decimal.

0.25 (1)

.....

(1)

(b) Write $\frac{34}{10}$ as a mixed number in its simplest form.

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

$= 3\frac{2}{5}$ (1)

$10\overline{)34}$ = 3, -30, 4

$3\frac{2}{5}$

.....

(2)

(c) Show that $\frac{3}{4} \div \frac{15}{16} = \frac{4}{5}$

LHS : $\frac{3}{4} \div \frac{15}{16}$

$\frac{\cancel{3}1}{\cancel{4}1} \times \frac{\cancel{16}4}{\cancel{15}5}$ (1) (1)

$\frac{4}{5}$ (shown)

(2)

(Total for Question 6 is 5 marks)

7

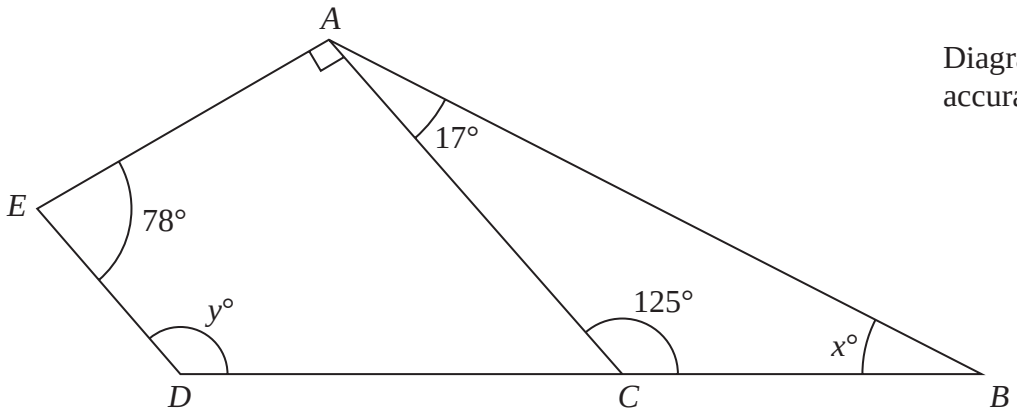


Diagram **NOT** accurately drawn

ABDE is a quadrilateral.
ABC is a triangle.
DCB is a straight line.

(a) (i) Work out the value of *x*.

$x = 180^\circ - 125^\circ - 17^\circ$

$= 38^\circ$ (1)

$x =$ 38

(1)

(ii) Give a reason for your answer.

Angles in a triangle sums up to 180° (1)

(1)

(b) Work out the value of *y*.
Give a reason for each stage of your working.

angle ACD $= 180^\circ - 125^\circ$ (1)
$= 55^\circ$ (angles on a straight line add up to 180°)

$y^\circ = 360^\circ - 78^\circ - 90^\circ - 55^\circ$ (1)

$= 137^\circ$ (1)

(angles in a quadrilateral adds up to 360°)

$y =$ 137

(3)

(Total for Question 7 is 5 marks)

8 (a) Simplify $6m - 2k + 5m - k$

$6m + 5m - 2k - k$

$11m - 3k$ (2)

$11m - 3k$

(2)

$P = 2a + 3b$

(b) Work out the value of P when $a = 5$ and $b = 8$

$P = 2(5) + 3(8)$

$= 10 + 24$ (1)

$= 34$ (1)

$P =$ 34

(2)

$P = 2a + 3b$

(c) Work out the value of a when $P = 16$ and $b = 20$

$16 = 2a + 3(20)$ (1)

$2a = 16 - 60$ (1)

$2a = -44$

$a = -22$ (1)

$a =$ -22

(3)

(Total for Question 8 is 7 marks)

9 Kamal sells 240 ice creams for a total of $640

$\frac{1}{3}$ of the ice creams he sells are large.

The cost of each large ice cream he sells is $3.80

All the other ice creams he sells are small.
He sells each small ice cream for the same cost.

Work out the cost of each small ice cream.

Large ice cream sold :

$\frac{1}{3} \times 240 = 80$ (1)

$80 \times 3.80 = \$304$ (1)

Total cost for small ice cream :

$640 - 304 = 336$

Cost for each small ice cream :

$\frac{336}{240 - 80} = \frac{336}{160}$ (1) $= \$2.10$ (1)

$ 2.10

(Total for Question 9 is 4 marks)

10 (a) Write the ratio 32 : 80 in its simplest form.

32 : 80 (1)

÷16 ↓ ↓ ÷16

2 : 5 (1)

2 : 5

(2)

There are only red counters and blue counters in a bag.
In the bag
the number of red counters : the number of blue counters = 5 : 7

(b) What fraction of the counters in the bag are red?

Total ratio : 5 + 7 = 12

red : $\frac{5}{12}$ (1)

$\frac{5}{12}$

(1)

(Total for Question 10 is 3 marks)

11 Kwo asked 40 people where they went on holiday last year.
He is going to draw a pie chart for his results.

16 of the 40 people said they went to Egypt.

(a) Work out the size of the angle in the pie chart for Egypt.

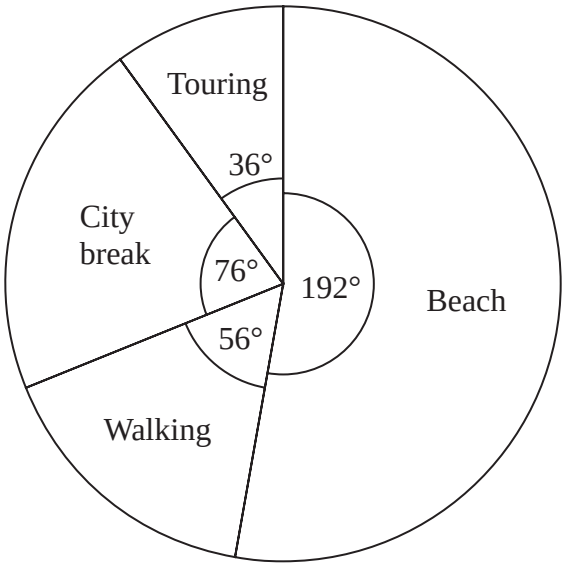
total angle in a pie chart

$\frac{16}{40} \times 360^\circ = 144^\circ$ (1) (1)

144 °

(2)

Tiffany asked some people what type of holiday they each like the best.
She used her results to draw this pie chart.



48 of the people that Tiffany asked said they like beach holidays the best.

(b) Work out how many of the people Tiffany asked said they like walking holidays the best.

$\frac{192}{360} = 48$ people $\qquad \frac{56}{360} = x$ people

$\frac{x}{48} = \frac{56}{192}$

$x = \frac{56}{192} \times 48 = 14$ (1) (1)

14

(2)

(Total for Question 11 is 4 marks)

12 Sam takes an English exam.
There are two papers in the exam.
Each paper has a maximum mark of 80

To pass the exam, Sam needs to get at least 60% of the total marks.

Sam gets 55% of the 80 marks in paper 1

Work out the least number of marks that Sam must get in paper 2 to pass the English exam.

To pass : $\frac{\text{Paper 1 + paper 2}}{160} \times 100\% > 60\%$

To get at least 60% : $\frac{x}{160} \times 100\% = 60\%$

$x = \frac{60}{100} \times 160 = 96$ (1)

↖ total paper 1 + paper 2

Paper 1 : $\frac{55}{100} \times 80 = 44$ marks (1)

To pass : $96 - 44$ (1)

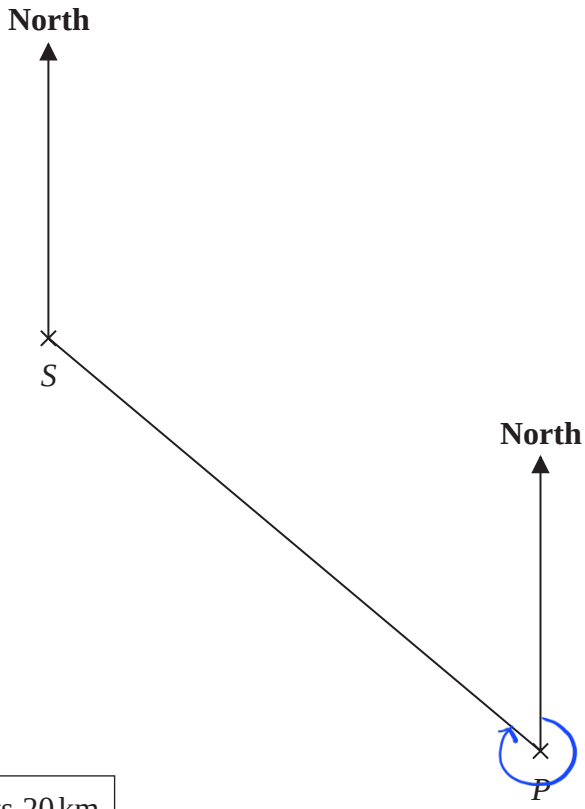
$= 52$ (1)

∴ Sam must get at least 52 in paper 2

52

(Total for Question 12 is 4 marks)

13 The scale drawing shows the positions of a ship, *S*, and a port, *P*.



Scale: 1 cm represents 20 km

(a) Find the bearing of *S* from *P*.

310 (1) °

(1)

The ship *S* now sails directly towards port *P*.
The ship sails at an average speed of 24 km/h.

speed = distance / time

(b) Work out how long it takes the ship to get to *P*.
Give your answer correct to the nearest hour.

SP = 8.5 cm (1) × 20 km / 1 cm = 170 km (1)

time = distance / speed = 170 km / 24 km/h (1)

= 7.08 h

≈ 7 hours (nearest hour) (1)

7 hours

(4)

(Total for Question 13 is 5 marks)

14 The point A has coordinates $(5, -4)$
The point B has coordinates $(13, 1)$

(a) Work out the coordinates of the midpoint of AB.

midpoint AB : $\left(\frac{5+13}{2}, \frac{-4+1}{2}\right)$ (1)

$= (9, -1.5)$ (1)

(9 , -1.5)

(2)

Line **L** has equation $y = 2 - 3x$

(b) Write down the gradient of line **L**.

$y = \underline{-3}x + 2$
$\uparrow m$

-3 (1)

(1)

Line **L** has equation $y = 2 - 3x$

(c) Does the point with coordinates $(100, -302)$ lie on line **L**?
You must give a reason for your answer.

$y + 3x = 2$

LHS : $-302 + 3(100) = -2$. No. The coordinate does not lie on line L.

(1)

(1)

(Total for Question 14 is 4 marks)

15 (a) Find the highest common factor (HCF) of 28 and 70

Factor of 28 : 1, 2, 4, 7, 14, 28 (1)

Factor of 70 : 1, 2, 5, 7, 10, 14, 35, 70

HCF of 28 and 70 is 14. (1)

14

(2)

(b) Find the lowest common multiple (LCM) of 28 and 105

Multiple of 28 : 28, 56, 84, 112, 140, 168, 196, 224, 252, 280, 308, 336, 364, 392, 420 (1)

Multiple of 105 : 105, 210, 315, 420

LCM of 28 and 105 is 420. (1)

420

(2)

(Total for Question 15 is 4 marks)

16 The diagram shows a shape.

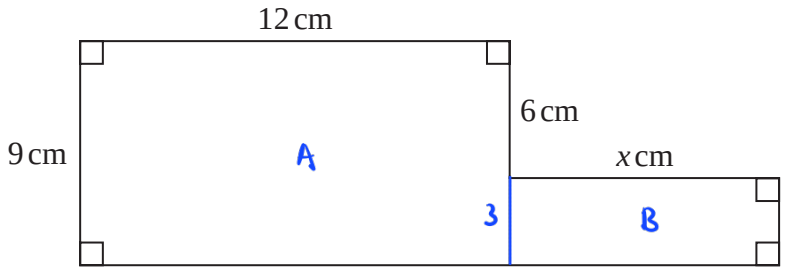


Diagram **NOT** accurately drawn

The shape has area 129 cm^2

Work out the value of x.

Total Area : Area of shape A + Area of shape B

$129 = (12 \times 9) + 3x$ (1)

$129 = 108 + 3x$ (1)

$3x = 129 - 108$

$3x = 21$

$x = \frac{21}{3}$ (1)

$= 7$ (1)

$x =$ 7

(Total for Question 16 is 4 marks)

17 The table shows information about the weights, in kilograms, of 40 babies.

Weight (w kg)	Frequency
$2 < w \leqslant 3$	12
$3 < w \leqslant 4$	16
$4 < w \leqslant 5$	9
$5 < w \leqslant 6$	2
$6 < w \leqslant 7$	1

(a) Write down the modal class.

modal class : class with highest frequency

$3 < w \leqslant 4$ (1)

.....

(1)

(b) Work out an estimate for the mean weight of the 40 babies.

Estimated Total weight = $(12 \times 2.5) + (16 \times 3.5) + (9 \times 4.5) + (2 \times 5.5) + (1 \times 6.5)$ (1)

$= 30 + 56 + 40.5 + 11 + 6.5$ (1)

$= 144$

Mean = $\frac{144}{40}$ (1) $= 3.6$ kg (1)

3.6 kg

.....

(4)

One of the 40 babies is going to be chosen at random.

(c) Find the probability that this baby has a weight of more than 5 kg.

Baby weight more than 5 kg = $\frac{2}{40} + \frac{1}{40}$ (1)

$= \frac{3}{40}$ (1)

$\frac{3}{40}$

.....

(2)

(Total for Question 17 is 7 marks)

18 120 children go on an activity holiday.
The ratio of the number of girls to the number of boys is 3 : 5

On Sunday, all the children either go sailing or go climbing.

$\frac{16}{25}$ of the boys go climbing.

Twice as many girls go sailing as go climbing.

Work out how many children go sailing on Sunday.

Total ratio : 3 + 5 = 8

$\frac{120}{8} = 15$ (1)

Boys : $5 \times 15 = 75$

Girls : $3 \times 15 = 45$ (1)

Climbing

Boys : $\frac{16}{25} \times 75 = 48$ (1)

Girls : $\frac{1}{3} \times 45 = 15$ (1)

Sailing

Boys : $75 - 48 = 27$

Girls : $45 - 15 = 30$

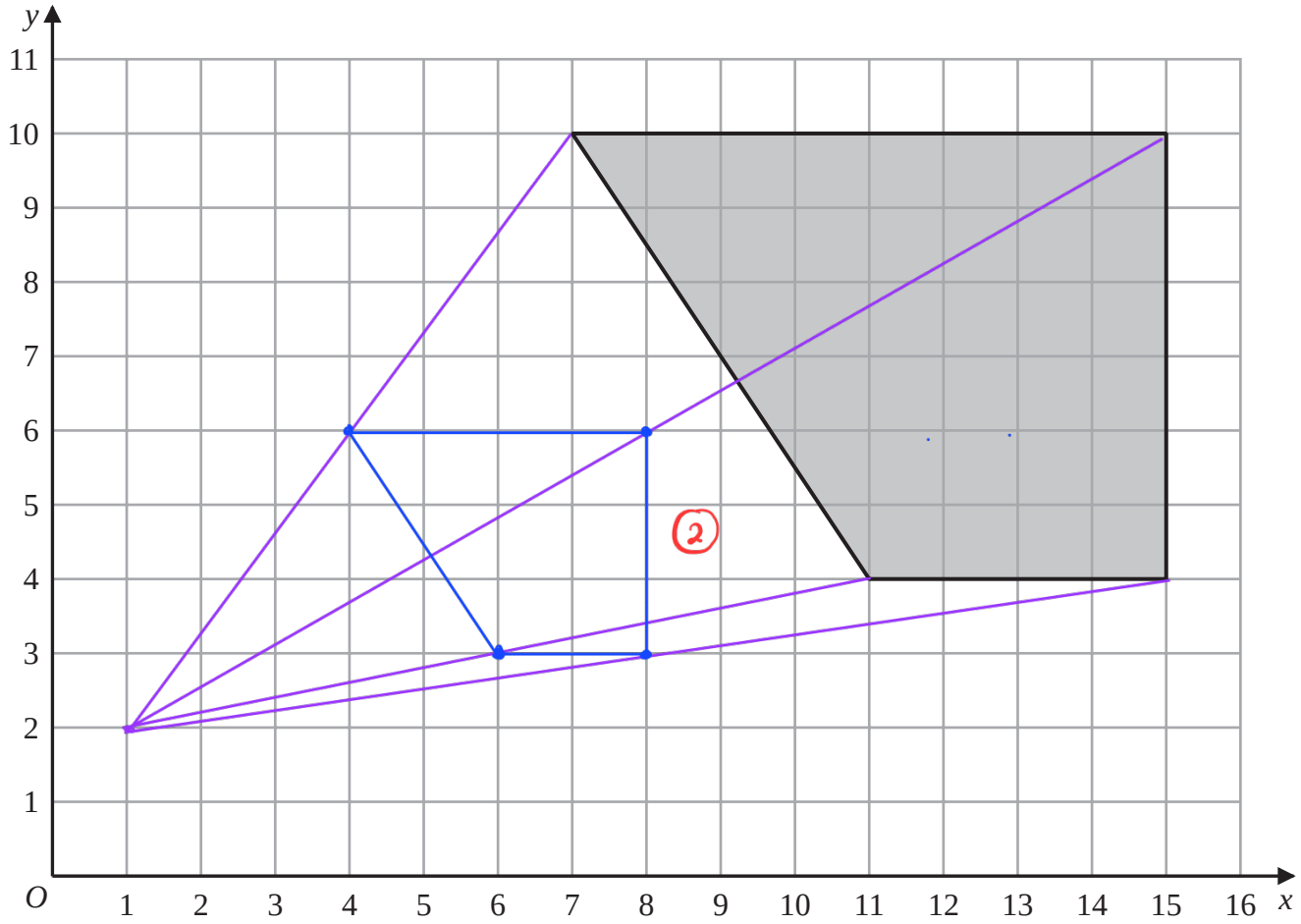
Total sailing : $27 + 30$ (1)

$= 57$ (1)

57

(Total for Question 18 is 6 marks)

19



On the grid, enlarge the shaded shape with scale factor $\frac{1}{2}$ and centre (1, 2)

(Total for Question 19 is 2 marks)

20 (a) Write 7.8×10^{-4} as an ordinary number.

0.00078

0.00078 (1)

.....

(1)

(b) Work out $\dfrac{5.6 \times 10^4 + 7 \times 10^3}{2.8 \times 10^{-3}}$

Give your answer in standard form.

$5.6 \times 10^4 \rightarrow 56 \times 10^3$

$$\frac{56 \times 10^3 + 7 \times 10^3}{2.8 \times 10^{-3}}$$ (1)

$$= \frac{63 \times 10^3}{2.8 \times 10^{-3}}$$

$= 2.25 \times 10^7$ (1)

2.25×10^7

.....

(2)

(Total for Question 20 is 3 marks)

21 (a) Expand and simplify $(m - 8)(m + 5)$

$m^2 + 5m - 8m - 40$ (1)

$= m^2 - 3m - 40$ (1)

$m^2 - 3m - 40$

(2)

(b) Factorise fully $5y + 20y^2$

$5y + 20y^2$

$5(y + 4y^2)$

$= 5y(1 + 4y)$ (2)

$5y(1+4y)$

(2)

(c) Simplify $(p^2 + 3)^0$

$x^0 = 1$

1 (1)

(1)

(d) Solve $3(2x - 5) = \frac{9 - x}{2}$

Show clear algebraic working.

$3(2x-5) = \frac{9-x}{2}$

$6x - 15 = \frac{9-x}{2}$ (1)

$2(6x-15) = 9-x$ (1)

$12x - 30 = 9 - x$

$12x + x = 9 + 30$ (1)

$13x = 39$

$x = \frac{39}{13}$

$= 3$ (1)

$x =$ 3

(4)

(Total for Question 21 is 9 marks)

Turn over for Question 22

22 Here is a right-angled triangle.

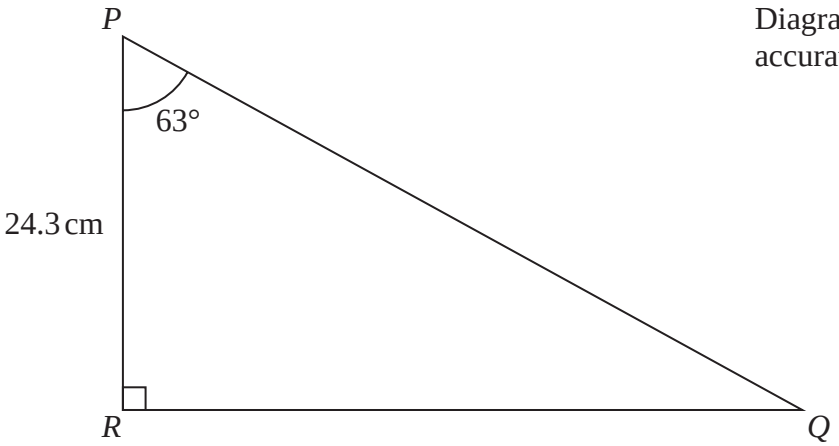


Diagram **NOT** accurately drawn

Calculate the length of PQ.
Give your answer correct to 3 significant figures.

$\cos 63^\circ = \frac{PR}{PQ}$

$\cos 63^\circ = \frac{24.3}{PQ}$ (1)

$PQ = \frac{24.3}{\cos 63^\circ}$ (1)

$= 53.5$ cm (1)

53.5 cm

(Total for Question 22 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS