Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Thursday 8 November 2018

Morning (Time: 1 hour 30 minutes) | Paper Reference **1MA1/2F**

Mathematics

Paper 2 (Calculator)
Foundation Tier

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
- 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.

Turn over ▶

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6/7/7/7/7/1/

P 5 5 5 8 7 A 0 1 2 0

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down the value of the 4 in the number 542.3

542.3
$= 500 + 40 + 2 + 0.3$

4= 40 (tens)

(Total for Question 1 is 1 mark)

2 Write down a square number that is also an odd number.

Square numbers: 1, 4, 9, 16, 25, 36, 49...
odd

1

(Total for Question 2 is 1 mark)

3 (a) Change 4560 g into kg.

1000g = 1kg
×4.56 → 4560g = 4.56 ← ×456

4.56 kg

(1)

(b) Change 7.3 m into mm.

1m = 100cm = 1000mm
×1000

$7.3 \times 1000 = 7300$mm

7300 mm

(1)

(Total for Question 3 is 2 marks)

4 Work out the cube root of 64

$4 \times 4 \times 4 = 64$

4

(Total for Question 4 is 1 mark)

5 Write 0.31 as a fraction.

31 hundredths $= \frac{31}{100}$

$\frac{31}{100}$

(Total for Question 5 is 1 mark)

6 Here are four fractions.

$\frac{3}{4}$ $\frac{5}{7}$ $\frac{19}{25}$ $\frac{11}{15}$

Write the fractions in order of size.
Start with the smallest fraction.

$\frac{3}{4} = 0.75$ (3)

$\frac{5}{7} = 0.714\ldots$ (1)

$\frac{19}{25} = 0.76$ (4)

$\frac{11}{15} = 0.733\ldots$ (2)

$\frac{5}{7}$, $\frac{11}{15}$, $\frac{3}{4}$, $\frac{19}{25}$

(Total for Question 6 is 2 marks)

7 (a) Simplify $3m - m - m + 3m$

$3 - 1 - 1 + 3 = 6 - 2 = 4$

4m

(1)

(b) Simplify $2 \times n \times p \times 4$

$2 \times 4 = 8$

8np

(1)

(Total for Question 7 is 2 marks)

8 A map has a scale of 1 cm to 14 km.

On the map, the distance between Manchester and London is 18.8 cm.

What is the real distance, in km, between Manchester and London?

1cm = 14km

×18.8 → 18.8 = 263.2 km ← ×18.8

263.2 km

(Total for Question 8 is 2 marks)

9 (a) The nth term of a sequence is $3n + 4$

Explain why 21 is not a term of this sequence.

$3n+4=21$
$3n=19$
$n=19/3$

If 21 is in the sequence, n would be a whole number. 19 is not divisible by 3, therefore n isn't a whole number and 21 is not a term

(2)

(b) Here are the first three terms of a different sequence.

1 (+1, ×2) 2 (+2, ×2) 4

Write down two numbers that could be the 4th term and the 5th term of this sequence.
Give the rule you have used to get your numbers.

① Adding 1 more than previous addition. $4^{th} = 4+3=7$
$5^{th} = 7+4=11$

② Multiplying by 2. $4^{th} = 4\times2=8$
$5^{th} = 8\times2=16$

(2)

(Total for Question 9 is 4 marks)

10 Here is a number machine.

input → ×5 → −2 → output

(a) Work out the **output** when the input is 8

$8\times5=40$
$40-2=38$

38

(1)

(b) Work out the **input** when the output is 28

$6 \xleftarrow{\div5} 30 \xleftarrow{+2} 28$

6

(2)

(Total for Question 10 is 3 marks)

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11 Adam gets a bonus of 30% of £80
Katy gets a bonus of £28

Work out the difference between the bonus Adam gets and the bonus Katy gets.

Adam: 30% of 80
$0.3 \times 80 = 24$

Katy: 28

$28 - 24 = 4$

£ 4

(Total for Question 11 is 3 marks)

12 There are 49 counters in a bag.

20 of the counters are red.
The rest of the counters are blue.

$49 - 20 = 29$ blue

One of the counters is taken at random.

Find the probability that the counter is blue.

$\frac{29}{49}$ ← blue
↖ Total

$\frac{29}{49}$

(Total for Question 12 is 2 marks)

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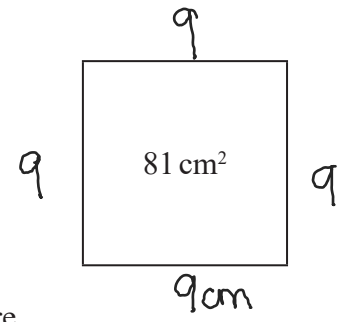
13 A square has an area of 81 cm^2



(a) Find the perimeter of the square.

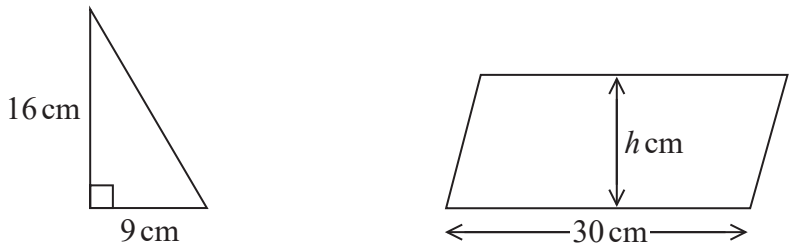
1 side length = $\sqrt{81}$ = 9cm

Perimeter = 9 x 4 = 36

36 cm

(2)

The diagram shows a right-angled triangle and a parallelogram.



The area of the parallelogram is 5 times the area of the triangle.
The perpendicular height of the parallelogram is h cm.

(b) Find the value of h.

Area of tri = $\frac{1}{2}$ x 16 x 9 = 72cm^2

72 x 5 = 360cm^2 = Area of parallelogram

h x w = Area

h x 30 = 360

h = 12 cm

h = 12cm

(3)

(Total for Question 13 is 5 marks)

14 Victoria throws an ordinary fair 6-sided dice once.

She says,

"The probability of getting a 3 is half the probability of getting a 6"

(a) Is Victoria correct?
You must explain your answer.

No, the dice is fair so the probability of rolling each number is $\frac{1}{6}$

(1)

Andy throws the dice twice.
He says,

"The probability of getting a 6 on both throws is $\frac{2}{6}$"

(b) Is Andy correct?
You must explain your answer.

No, probability of 6 = $\frac{1}{6}$ p(6 and 6) = $\frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$
$\frac{1}{36} \neq \frac{2}{6}$

(1)

Indre throws the dice once.
She also throws a coin to get Heads or Tails.

H = heads
T = tails

(c) List all the possible outcomes she can get.

1+H, 1+T, 2+H, 2+T, 3+H, 3+T, 4+H, 4+T, 5+T, 5+H, 6+H, 6+T

(2)

(Total for Question 14 is 4 marks)

15 Remi invests £600 for 5 years in a savings account.
By the end of the 5 years he has received a total of £75 simple interest.

Work out the annual rate of simple interest.

interest for 1 year = 75 ÷ 5 = 15

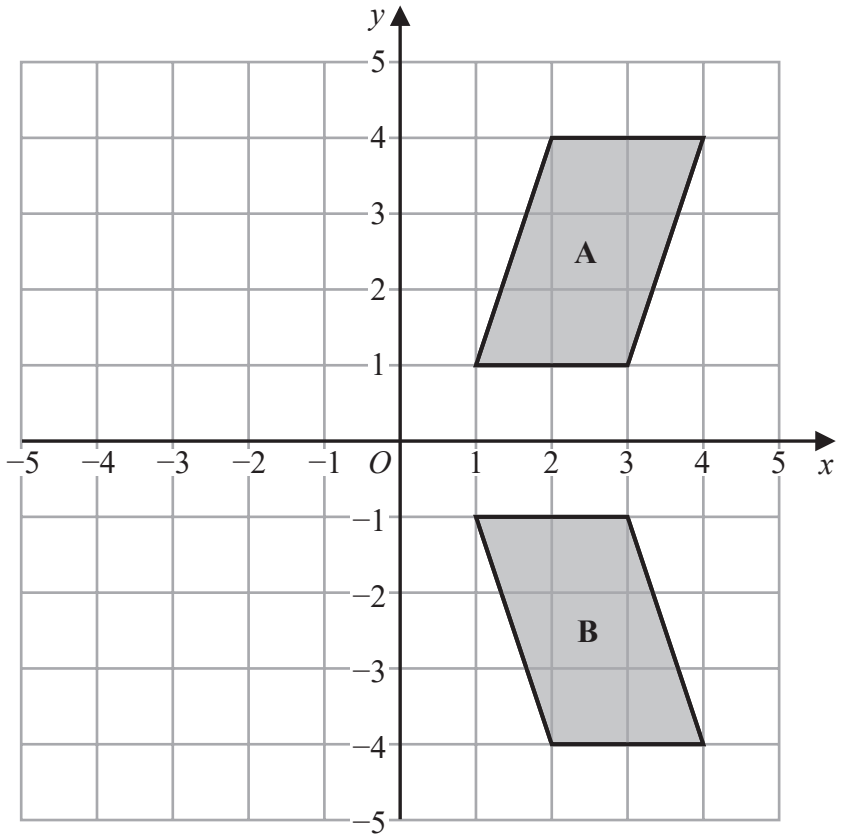
percentage of interest = $\frac{15}{600}$ × 100 ← total

= 2.5 %

2.5 %

(Total for Question 15 is 3 marks)

16



Describe fully the single transformation that maps shape **A** onto shape **B**.

Reflection in x axis / y=0

(Total for Question 16 is 2 marks)

17 Adrian is going to make concrete.
He is going to use

180 kg of cement
375 kg of sand
1080 kg of stone

Cement, sand and stone are sold in bags.

1 bag cement	1 bag sand	1 bag stone
25 kg	22.5 kg	50 kg

Adrian already has

10 bags of cement
20 bags of sand
20 bags of stone

Work out what bags he needs to buy to make the concrete.

Cement: 180 ÷ 25 = 6 r 20 round up 7 bags ✓ has 10

Sand : 375 ÷ 22.5 = 16.6 round up 17 bags ✓ has 20

Stone : 1080 ÷ 50 = 21.6 round up 22 bags ✗ has 20

22 - 20 = 2

Adrian needs 2 more bags of stone

(Total for Question 17 is 3 marks)

18 Bill wants to increase 150 by 3%
He writes down

$$150 \times 1.3 = 195$$

÷100
% to dp

Bill's method is wrong.

(a) Explain why.

3% = 0.03 not 0.3, 3 ÷ 100 = 0.3,
multiplier should be 1.03

(1)

Sally wants to decrease 150 by 3%

(b) Complete this statement to show how Sally can decrease 150 by 3%

3% = 0.03
1 − 0.03
= 0.97

150 × 0.97 = 145.5

(1)

(Total for Question 18 is 2 marks)

19 (a) Solve $3(x - 4) = 12$

$3x - 12 = 12$
$+12$
$3x = 24$
$\div 3$
$x = 8$

$x =$ 8

(2)

(b) Factorise fully $9b - 3b^2$

3 is a factor
b is a factor

$3b(3 - b)$

$9b \div 3b = 3$
$-3b^2 \div 3b = -b$

3b(3 − b)

(2)

(Total for Question 19 is 4 marks)

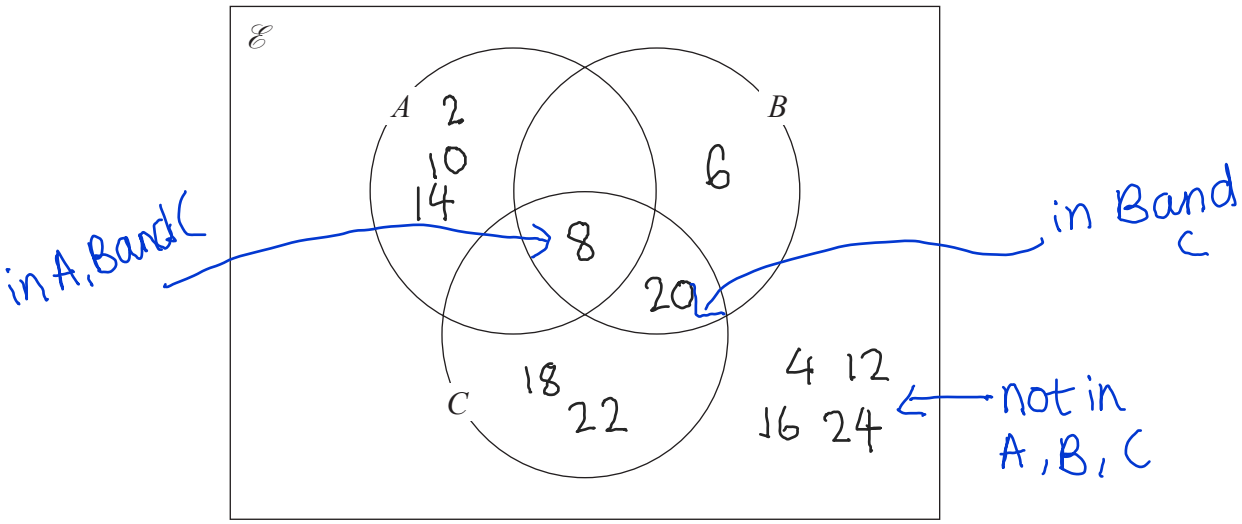
20 $\mathscr{E}$ = {even numbers between 1 and 25} 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

A = {2, 8, 10, 14}

B = {6, 8, 20}

C = {8, 18, 20, 22}

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from $\mathscr{E}$.

(b) Find the probability that the number is a member of $A \cap B$.

only 1 in A∩B (8) → 1/12 ← Total numbers

A and B → 1 and 1 → 8

1/12

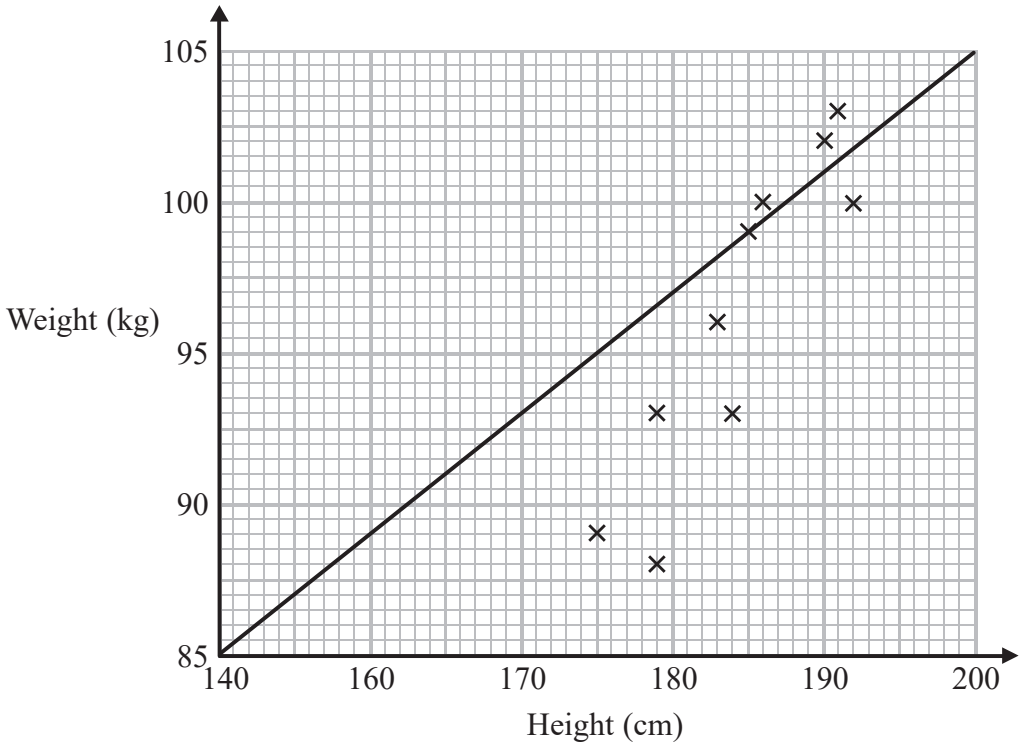
(2)

(Total for Question 20 is 6 marks)

21 Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players.

He is asked to draw a scatter graph and a line of best fit for this information.

Here is his answer.



Sean has plotted the points accurately.

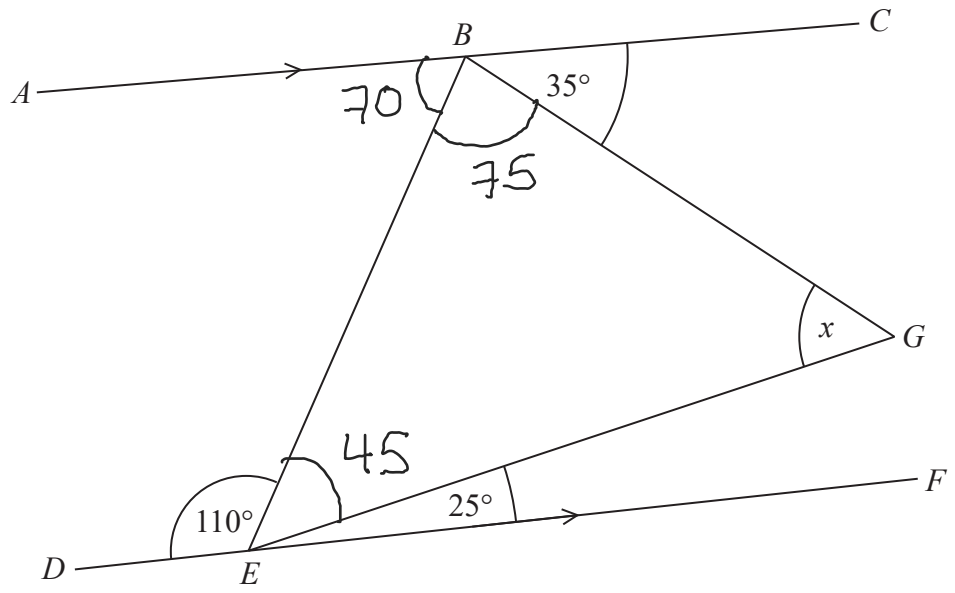
Write down two things that are wrong with his answer.

1 The line of best fit doesn't fit in the general trend

2 The x axis for height is missing 150cm

(Total for Question 21 is 2 marks)

22 *BEG* is a triangle.



ABC and *DEF* are parallel lines.

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

$\angle BEG = 180 - 25 - 110 = 45^\circ$ angles on straight line add up to 180°

$\angle EBA = 45 + 25 = 70^\circ$ alternate angles (Z) are equal

$\angle EBG = 180 - 70 - 35 = 75^\circ$ angles on straight line = 180

$\angle x = 180 - 75 - 45 = 60^\circ$ angles in triangle add up to 180

.....°

(Total for Question 22 is 4 marks)

23 Northern Bank has two types of account.
Both accounts pay compound interest.

Cash savings account	**Shares account**
Interest	Interest
2.5% per annum	3.5% per annum

Ali invests £2000 in the cash savings account.
Ben invests £1600 in the shares account.

(a) Work out who will get the most interest by the end of 3 years.
You must show all your working.

Ali 2.5 interest = ×1.025 ← for 3 years

$2000 \times 1.025^3 = £2153.78$

2153.78 − 2000 = £153.78
final amount − inital amount → Ali gains this

Ben 3.5 interest = ×1.035

$1600 \times 1.035^3 = £1773.95$

1773.95 − 1600 = £173.95

173.95 > 153.78 - Ben earns more interest

(4)

In the 3rd year the rate of interest for the shares account is changed to 4% per annum.

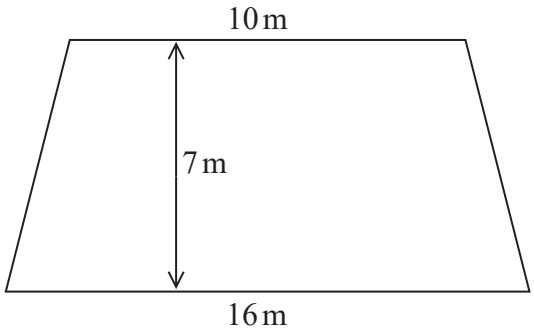
(b) Does this affect who will get the most interest by the end of 3 years?
Give a reason for your answer.

No, Ben already gets the most interest so increasing it will mean Ben gets even more

(1)

(Total for Question 23 is 5 marks)

24 The diagram shows a floor in the shape of a trapezium.



£16.99

John is going to paint the floor.

Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

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

$= \frac{1}{2}(10+16)\times 7 = 91 cm^2$

Number of litres of paint = $91 \div 2 = 45.5\ell$

↳ 1ℓ covers $2m^2$

Number of 5ℓ tins = $45.5 \div 5 = 9.1$

= 10 tins needed (round up)

1 tin costs £16.99

10 tins cost $10 \times 16.99 = £169.90$

169.90 > 160, John doesn't have enough

(Total for Question 24 is 5 marks)

25 A is the point with coordinates (5, 9)
B is the point with coordinates (d, 15)

The gradient of the line AB is 3

Work out the value of d.

(m) gradient = $\frac{y_1 - y_2}{x_1 - x_2}$

$m = \frac{15 - 9}{d - 5}$

$3 = \frac{6}{d-5}$ (× and ÷)

$d - 5 = \frac{6}{3}$

$d = 2 + 5 = 7$

$d = 7$

(Total for Question 25 is 3 marks)

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26 (a) Expand and simplify $(5x + 2)(2x - 3)$

$10x^2 - 15x + 4x - 6$

$-11x$

$10x^2 - 11x - 6$

(2)

(b) Factorise $x^2 + 4x + 3$

$+x$

2 numbers that add to 4 and x to 3

$3 + 1 = 4 \quad 3 \times 1 = 3$

$(x + 3)(x + 1)$

(2)

(Total for Question 26 is 4 marks)

27 (a) Write the number 0.00007547 in standard form.

between 1 and 10

7.547×10^{-5} ← dp moves 5 spaces

7.547×10^{-5}

(1)

(b) Write 3.42×10^4 as an ordinary number.

3.42000

1 2 3 4

34200

(1)

(c) Work out $\dfrac{2.3 \times 10^4 \times 6.7 \times 10^3}{5 \times 10^{-8}}$

$= \dfrac{1.541 \times 10^8}{5 \times 10^{-8}}$ $= 3.082 \times 10^{15}$

type in calculator

3.082×10^{15}

(2)

(Total for Question 27 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

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