Please check the examination details below before entering your candidate information				
Candidate surname			Other name	S
Pearson Edexcel International GCSE	Centre	e Number		Candidate Number
Tuesday 19 l	May	202	20	
Morning (Time: 1 hour 30 minu	utes)	Paper R	eference 4	MB1/01R
Mathematics I Paper 1R	B			
You must have: Ruler graduat protractor, pair of compasses, Tracing paper may be used.	ted in cen pen, HB p	timetres a encil, era	and millimo ser, calcula	etres, ator.

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.
- Calculators may be used.

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.
- Without sufficient working, correct answers may be awarded no marks.





Turn over 🕨



Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Ali, Beth and Chari pay rent on a piece of woodland. The annual rent that they pay is such that

the amount Ali pays : the amount Beth pays : the amount Chari pays = 13 : 8 : 11

The amount that Chari pays = \$2563

Calculate how much more rent Ali pays than Beth pays.

\$

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(Total for Question 1 is 2 marks)

2 Simplify fully $\frac{8(2x+3)^2}{8x+12}$

(Total for Question 2 is 2 marks)



$$5\frac{1}{3} \div 2\frac{3}{5}$$

Give your answer as a mixed number in its simplest form.

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(Total for Question 3 is 3 marks)

4 Ashley takes 3 hours and 36 minutes to walk around a lake. The distance she walks is 11 520 m.

Calculate Ashley's average speed. Give your answer in kilometres per hour.

kilometres per hour

(Total for Question 4 is 3 marks)



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5 L	liam :	started	a new	job	on a	a salary	of \$45 500	
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At the end of 1 year he is given a pay increase of 5.5% At the end of each subsequent year he is given a pay increase of 1.25%

Calculate, to the nearest \$, Liam's salary at the end of 3 years after he started the job.

\$

(Total for Question 5 is 3 marks)

6 The straight line L has equation 2y - 5 = 3x

(a) Find the gradient of L

(b) Find the coordinates of the point where L meets the *y*-axis.

(....., (1)

(2)

...)

(Total for Question 6 is 3 marks)



7 Arthur has 10 cards.

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Each card has a letter on it and the letters spell the word PICCADILLY



(Total for Question 7 is 3 marks)

8 Without using a calculator and showing all your working, solve the inequality

 $6x^2 - x - 12 > 0$

(Total for Question 8 is 3 marks)



9 The function f is defined by

$$f: x \mapsto \frac{3x}{2(x+2)} \qquad x \neq -2$$

Express the inverse function f^{-1} in the form $f^{-1} : x \mapsto ...$

 $\mathbf{f}^{-1}: x \mapsto$

(Total for Question 9 is 3 marks)

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$$\frac{6-\sqrt{8}}{2+\sqrt{8}}$$

in the form $a + \sqrt{b}$ where a and b are integers.

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(Total for Question 10 is 3 marks)



11 Given that $-3x^2 + 6x + 2$ can be written in the form $a(x + b)^2 + c$ where *a*, *b* and *c* are integers, find the value of *a*, the value of *b* and the value of *c*.

<i>a</i> =	
<i>b</i> =	
c =	

(Total for Question 11 is 3 marks)



12 The incomplete table and pie chart below show information about the favourite type of chocolate of 440 adults.

Type of chocolate	Number of adults
Milk	209
Plain	
White	
Total	440



Complete the table and the pie chart.

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(Total for Question 12 is 4 marks)



13 Here is information about the age, in years, of each of Jelina's five children when written in order.

a b
$$\frac{b}{2}$$
 + *a* $2b$ + *a* + 3 $2b$ + *a* + 5

It is given that

a is the age of the youngest child

 $a \neq b$

two of the children have the same age the mean age of the five children is 10.6 years

Calculate the value of a and the value of b

Show clear algebraic working.

a =

b =

(Total for Question 13 is 4 marks)





The diagram shows a triangle *ABC*.

The point D lies on AC so that BD is perpendicular to AC.

 $\angle BAD = 64^{\circ}$ $\angle ACB = 28^{\circ}$ AD = 2 cm

14

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Calculate the length, in cm to one decimal place, of BC.

(Total for Question 14 is 4 marks)



15 (a)
$$\mathbf{A} = \begin{pmatrix} 3 & -1 \\ -4 & 2 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 2 & -\frac{1}{2} \\ 2 & -2 \end{pmatrix}$$

Calculate $3\mathbf{A} - 2\mathbf{B}$

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(b)

$$\mathbf{P} = \begin{pmatrix} 5 & -3 \\ -3 & 2 \end{pmatrix} \qquad \mathbf{Q}\mathbf{P}^{-1} = \begin{pmatrix} 0 & 1 \\ -10 & -17 \end{pmatrix}$$

Find the matrix \mathbf{Q}



(2)

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(Total for Question 15 is 4 marks)





Diagram **NOT** accurately drawn

The diagram shows a circle JKML.

16

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JKP and LMP are straight lines. JK = 3 cm, KP = 2.5 cm and PM = 2 cm. $\angle JPL = 74^{\circ}$

Calculate the area, in cm^2 to 2 decimal places, of triangle *LKP*.

..... cm²

(Total for Question 16 is 4 marks)





P 6 2 0 1 8 A 0 1 4 2 4



19



The diagram shows triangle ABC and triangle ADC.

E is the point on *BC* and *AD*. *F* is the point on *AC* such that *AB*, *FE* and *CD* are parallel.

Given that AB = 3 cm and that CD = 7 cm,

calculate the length of FE.

(Total for Question 19 is 5 marks)



cm



The diagram shows quadrilateral ABCD.

The region \mathbf{R} consists of all the points inside the quadrilateral that are

(i) closer to DA than to DC,

(ii) less than 3 cm from the side DC,

(iii) more than 4 cm from B.

Using ruler and compasses only and **showing all your construction lines**, construct and show, by shading, the region \mathbf{R} . Label the region \mathbf{R} .

(Total for Question 20 is 5 marks)





Diagram **NOT** accurately drawn

The diagram shows a shaded 7-sided shape *ABCDEFG*. The points *A*, *B*, *C*, *D*, *E*, *F* and *G* are 7 vertices of a regular polygon with 11 sides.

 $\angle GAB = \angle AGF = x^{\circ}$

21

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Calculate the value, to 3 significant figures, of x. Show your working clearly.



x =





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23 y is directly proportional to x^3 x is inversely proportional to the square root of w.

y = 729 when x = 4.5x = 25 when w = 0.16

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Find a formula for *y* in terms of *w*.

(Total for Question 23 is 5 marks)



24 (2x + 1), (10x - 10) and (35x - 5) are the first three terms of a sequence.

The first term of the sequence is (2x + 1) where $(2x + 1) \neq 0$

After the first term, all other terms of the sequence are found by using the rule

'multiply the previous term by d'

Given that *x* is an integer,

find the value of *d*.

d =

(Total for Question 24 is 5 marks)



25

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C Diagram **NOT** accurately drawn

В

ABC is a triangle.

$$\overrightarrow{AB} = \begin{pmatrix} 3 \\ -2 \end{pmatrix} \overrightarrow{BC} = \begin{pmatrix} x \\ 5x \end{pmatrix}$$
 where $x > 0$ and $|\overrightarrow{AC}| = 5$

A

Find \overrightarrow{AC} as a column vector. Show clear algebraic working.

(Total for Question 25 is 5 marks)



26 A small ball is thrown into the air from a point that is 1 m above horizontal ground.

The ball moves vertically upwards so that at time t seconds after the ball was thrown, the height, h metres, of the ball above the ground is given by

 $h = 1 + kt - 5t^2$ where k is a constant.

At time t seconds after the ball was thrown, the velocity of the ball is vm/s.

(a) Find an expression for v in terms of k and t.

Given that the total distance travelled by the ball between the instant when the ball is thrown and when it hits the ground for the first time is 161 m,

(b) calculate the value of *k*.

(5)

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(Total for Question 26 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS







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