Write your name here

Surname

Other names

Pearson Edexcel
International GCSE

Centre Number

Candidate Number

Mathematics B
Paper 1

Monday 8 January 2018 – Morning
Time: 1 hour 30 minutes

Paper Reference
4MB0/01

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.
- 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 ▶

Pearson

Answer ALL TWENTY SEVEN questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1   Bananas, sugar cane and fish are the exports of a small country.
   In 2017 the total value of its exports was $3 690 000
   A pie chart was drawn for the values of the different exports in 2017 and the angle in the
   pie chart for bananas was 48.6°

   Calculate the value of the bananas exported in 2017

   $..

   (Total for Question 1 is 2 marks)

2   Find the Lowest Common Multiple (LCM) of 84 and 40

   Show your working clearly.

   ....

   (Total for Question 2 is 2 marks)

3 Show that $4\dfrac{1}{6} - 2\dfrac{1}{4} = 1\dfrac{11}{12}$

Show your working clearly.

<div align="right">

(Total for Question 3 is 2 marks)

</div>

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

Determine whether 117 is a term of the sequence.

Show your working clearly.

<div align="right">

(Total for Question 4 is 2 marks)

</div>

5 *OAB* is a sector of a circle with centre *O* and radius 14 cm.

The size of angle *AOB* is 68°

Find the length, in cm to 3 significant figures, of arc *AB*.

.... cm

(Total for Question 5 is 2 marks)

6 The size of each interior angle of a regular polygon is 165°

Calculate the number of sides of the polygon.

....

(Total for Question 6 is 2 marks)

7 Find the integer values of x such that $-6 < 2x - 3 < 3$

....

(Total for Question 7 is 3 marks)

8

Country	Currency	Exchange Rate
Spain	euro	£1 = 1.18 euros
Japan	yen	£1 = 136 yen

Using the information in the table, change

(a) £2500 into yen,

.... yen

(1)

(b) 45 600 yen into euros.

.... euros

(2)

(Total for Question 8 is 3 marks)

9 $32 = 4^{(x + 4)}$

Calculate the value of x.

$x = $ ....

(Total for Question 9 is 3 marks)

10

Diagram **NOT**
accurately drawn

$y = x - 2$

$y = 1$

$x + y = 7$
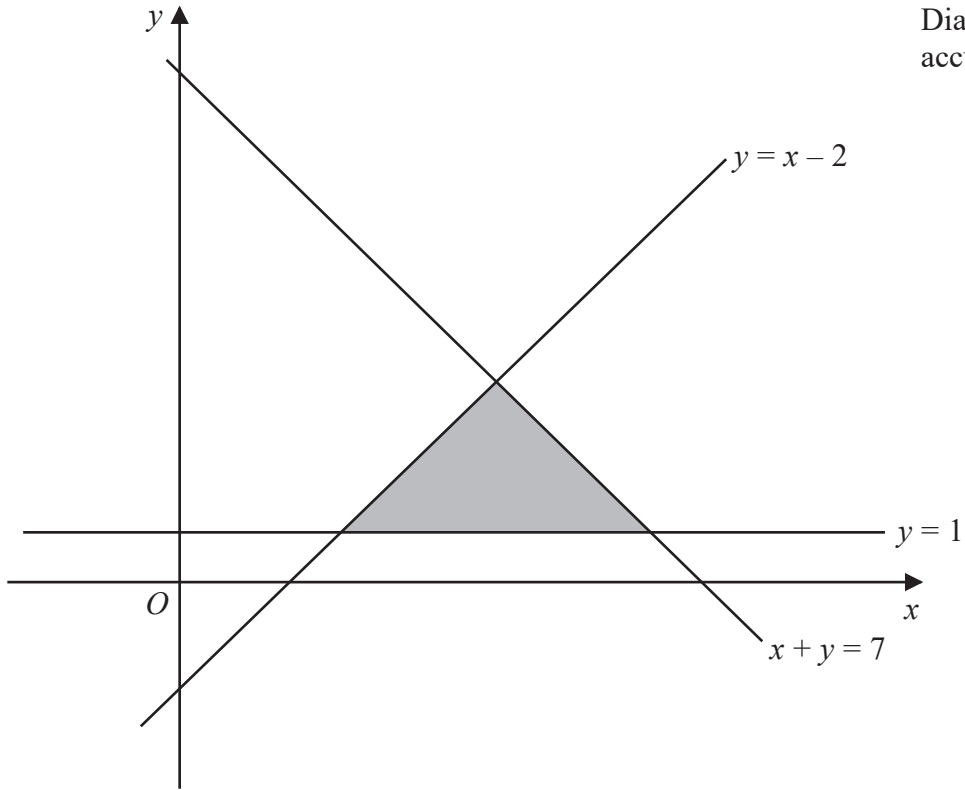
Write down the three inequalities that define the shaded region in the diagram above.

....

....

....

(Total for Question 10 is 3 marks)

11 Here are the marks 10 students got in a test.

$$9 \quad 2 \quad 4 \quad 6 \quad 4 \quad 4 \quad 7 \quad 10 \quad 3 \quad 9$$

(a) Write down the mode.

....

(b) Calculate the mean mark.

....

(Total for Question 11 is 3 marks)

12 $A = 73\,560.58$ $B = 351.6345$

(a) Calculate $A \div B$
   Give your answer to 1 decimal place.

....

(b) Calculate $A \times B$
   Give your answer in standard form to 3 significant figures.

....

(Total for Question 12 is 3 marks)

13 A box contains only 8 blue discs, 7 green discs and 5 yellow discs.
Discs are to be taken at random from the box and **not** replaced.

Find the probability that

(a) the first disc taken from the box will be a blue disc or a green disc,

....

(1)

(b) the first two discs taken from the box will be the same colour.

....

(2)

(Total for Question 13 is 3 marks)
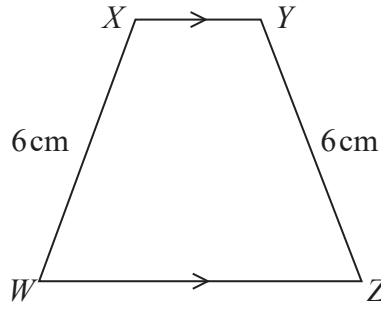
14 Here are two trapeziums.
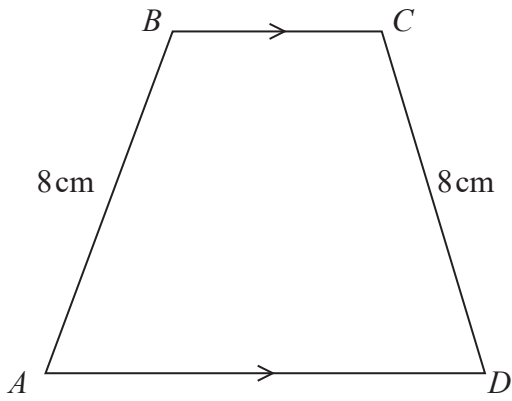
Diagram **NOT** accurately drawn

The trapeziums *ABCD* and *WXYZ* are mathematically similar.

The area of trapezium *ABCD* is 36 cm²

Calculate the area of trapezium *WXYZ*.

.... cm²

(Total for Question 14 is 3 marks)

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15 Solve the simultaneous equations

$$3x - 2y = -4$$
$$6x + 5y = 37$$

Show clear algebraic working.

$x = $ ....

$y = $ ....

(Total for Question 15 is 3 marks)

P 5 3 3 0 4 A 0 1 1 3 2

Turn over ▶

16 $y = 2x^4 + \dfrac{6 - 5x}{x}$

Find $\dfrac{\text{d}y}{\text{d}x}$

$\dfrac{\text{d}y}{\text{d}x} =$ ....

(Total for Question 16 is 3 marks)

17 Make t the subject of $u = \dfrac{5 - 4t}{3 + 6t}$

....

(Total for Question 17 is 4 marks)

18 $A = \begin{pmatrix} 2p & 3p-2 \\ -4 & p \end{pmatrix}$

The determinant of $A = 46$

Find the possible values of p

....

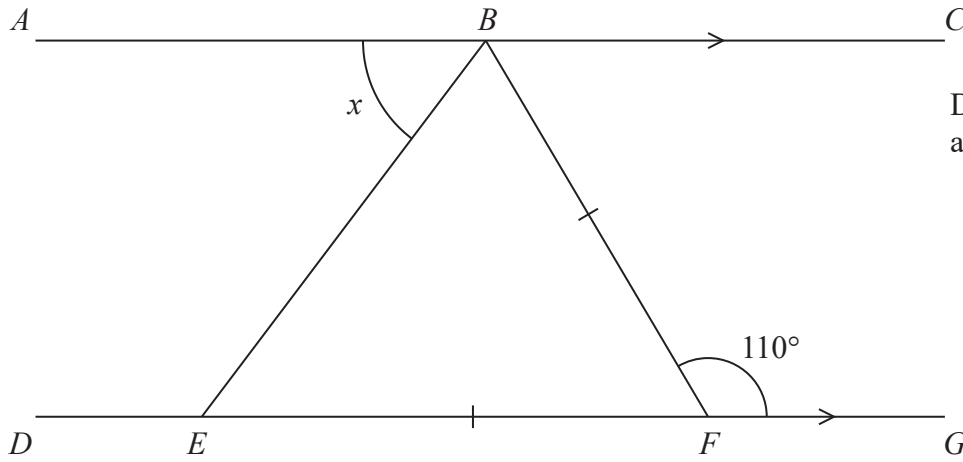**(Total for Question 18 is 4 marks)**

19

Diagram **NOT** accurately drawn

ABC and *DEFG* are parallel lines and *EF = BF*.
Angle *BFG* = 110°

Calculate, in degrees, the size of angle *x*.
Give reasons for each stage of your working.

.... °

(Total for Question 19 is 4 marks)

P 5 3 3 0 4 A 0 1 4 3 2

20

Diagram **NOT** accurately drawn

8 cm

53°
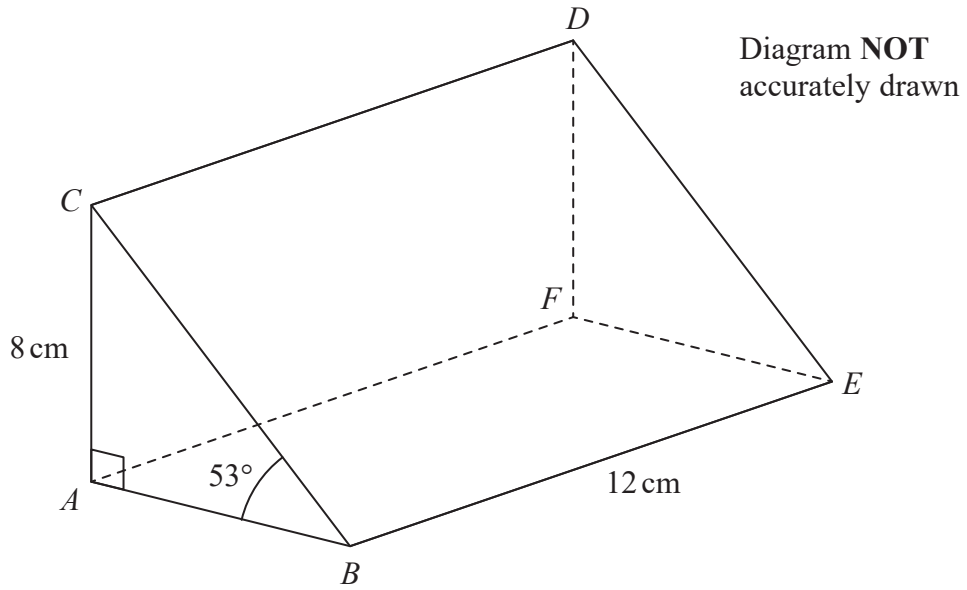
12 cm

ABCDEF is a triangular prism.

$$AC = FD = 8\,\text{cm} \qquad\qquad BE = AF = CD = 12\,\text{cm}$$

$$\angle ABC = \angle FED = 53° \qquad\qquad \angle BAC = \angle EFD = 90°$$

(a) Calculate, in cm to 2 decimal places, the length of *AB*.

.... cm

(2)

(b) Calculate the volume, in cm³ to 3 significant figures, of the prism.

.... cm³

(2)

(Total for Question 20 is 4 marks)

21 $\overrightarrow{OX} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and $\overrightarrow{OY} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$

(a) Express $\overrightarrow{XY}$ as a column vector.

$$\overrightarrow{XY} = \begin{pmatrix} \\ \\ \end{pmatrix}$$

(2)

(b) Calculate $\left|\overrightarrow{XY}\right|$, giving your answer as a surd.

$\left|\overrightarrow{XY}\right| = $ ....

(2)

(c) Hence write down a unit vector that is parallel to $\overrightarrow{XY}$.

....

(1)

(Total for Question 21 is 5 marks)

22 y is inversely proportional to the cube of x.

$$y = \frac{32}{27} \text{ when } x = \frac{3}{2}$$

(a) Find a formula for y in terms of x.

....

(3)

(b) Find the value of y when $x = 0.5$

$y =$ ....

(1)

P 5 3 3 0 4 A 0 1 8 3 2

(c) Find the value of x when $y = \dfrac{125}{128}$

$x =$ ....

(2)

(Total for Question 22 is 6 marks)

23 The diagram shows shape **S**.

x cm

(*x* − 1) cm

Diagram **NOT** accurately drawn

(*x* + 4) cm

(*x* + 7) cm
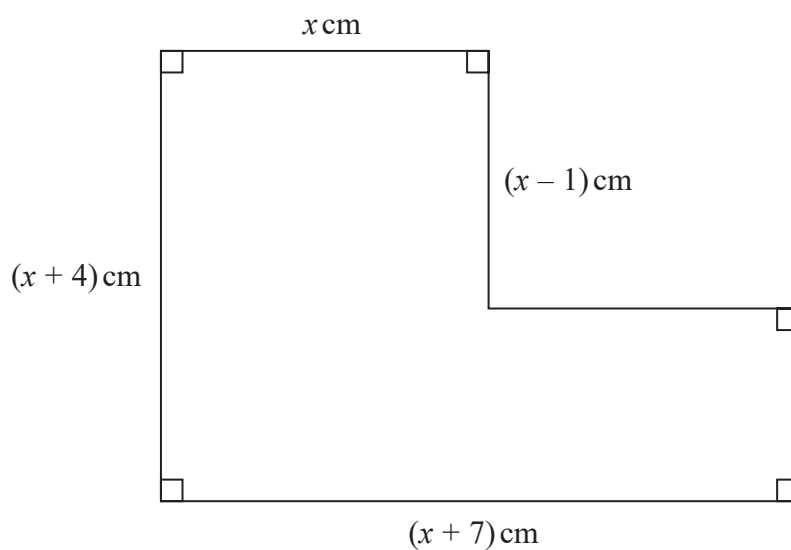
The area of **S** is $131\,\text{cm}^2$

(a) Show that $x^2 + 4x - 96 = 0$

(3)

(b) Hence find the perimeter of **S**.

.... cm

(3)

(Total for Question 23 is 6 marks)

Turn over ▶

24 $\mathscr{E}$ is the universal set and A, B and C are three sets where

$\mathscr{E}$ = {positive integers less than 15}
A = {odd numbers}
B = {factors of 12}
C = {multiples of 3}

(a) Complete the Venn diagram below.
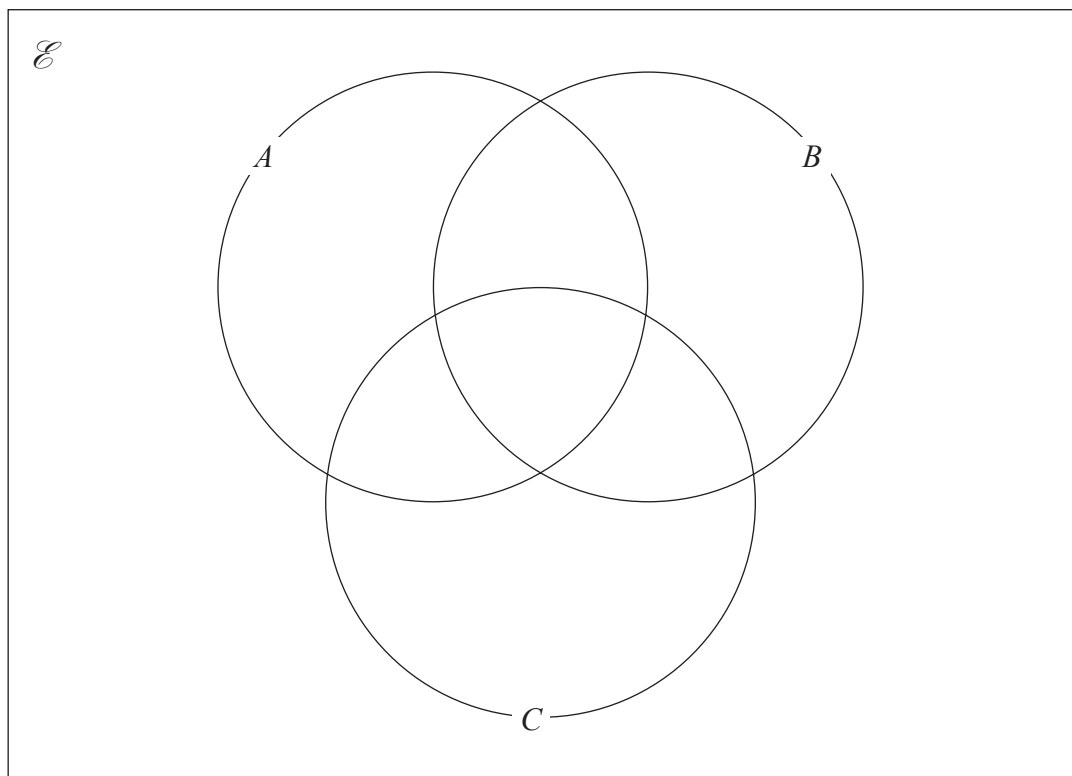
(3)

List the elements of the sets

(b) $B \cup C$

....

(c) $A \cap B$

....

(d) Find n($[A \cup B \cup C]'$)

....

(Total for Question 24 is 6 marks)

Turn over ▶

25

Diagram **NOT**
accurately drawn
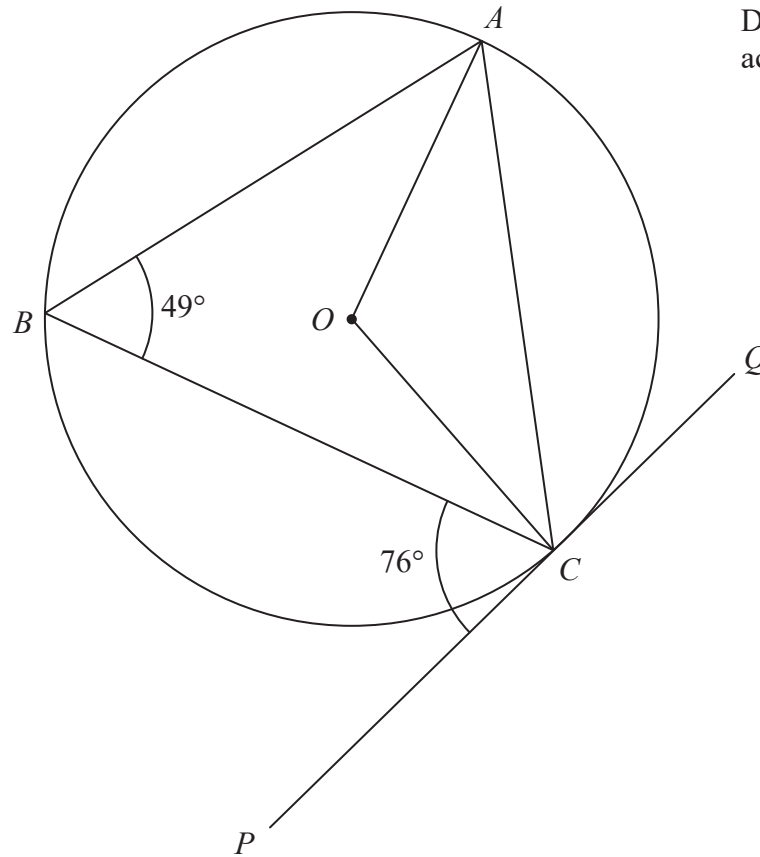
A, *B* and *C* are points on a circle with centre *O*.
PCQ is the tangent to the circle at *C*.
∠*ABC* = 49° and ∠*BCP* = 76°

(a) Explain why ∠*OCQ* = 90°

....

....

(1)

(b) Find, giving your reasons, the size, in degrees of

(i) $\angle ACQ$

$\angle ACQ = $ ....° °

(2)

(ii) $\angle BAO$

$\angle BAO = $ ....° °

(3)

(Total for Question 25 is 6 marks)

26 A car travels from rest between two sets of traffic lights in 45 seconds.
The speed-time graph below gives information about this journey.

Speed (m/s)

Time (seconds)
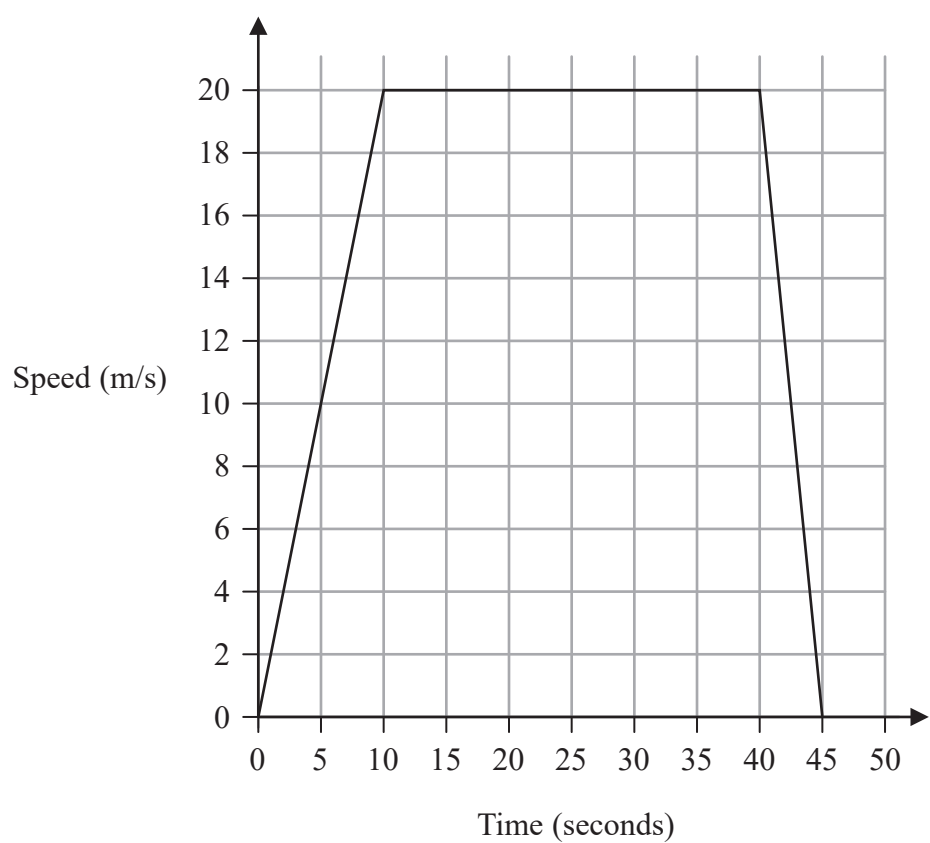
(a) Calculate the acceleration of the car during the first 10 seconds of its journey.

....m/s^2

(2)

(b) Find the total distance travelled by the car between the two sets of traffic lights.

....m

(2)

(c) Find the average speed of the car on its journey between the two sets of traffic lights.

....m/s

(2)

(Total for Question 26 is 6 marks)

27 f, g and h are three functions such that

$$f(x) = 2 + x \qquad g(x) = 3 + \sqrt{x - 4} \qquad h(x) = \frac{x}{x - 3}$$

Given that the domain of $g(x)$ is $\{x : x \geqslant 5\}$

(a) write down the range of $g(x)$

....
(1)

(b) Write down the value of x that must be excluded from any domain of h

....
(1)

(c) Find $h^{-1}(5)$

$h^{-1}(5) =$ ....
(4)

(d) Find and simplify an expression in terms of x for ff(x)

ff(x) = ...

(1)

(Total for Question 27 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS

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