Gold Level

Question Paper 13

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Question Paper 13

Time Allowed: 58 minutes

Score: /48

Percentage: /100

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	65%	55%	45%	35%	25%	15%	<15%

1 The grouped frequency table gives information about the lengths of time 160 students exercised one day.

Time (*t* minutes)	Frequency
$0 < t \leqslant 40$	20
$40 < t \leqslant 80$	35
$80 < t \leqslant 120$	60
$120 < t \leqslant 160$	33
$160 < t \leqslant 200$	7
$200 < t \leqslant 240$	5

(a) Complete the cumulative frequency table.

Time (*t* minutes)	Cumulative frequency
$0 < t \leqslant 40$	
$0 < t \leqslant 80$	
$0 < t \leqslant 120$	
$0 < t \leqslant 160$	
$0 < t \leqslant 200$	
$0 < t \leqslant 240$	

(1)

(b) On the grid, draw a cumulative frequency graph for your table.
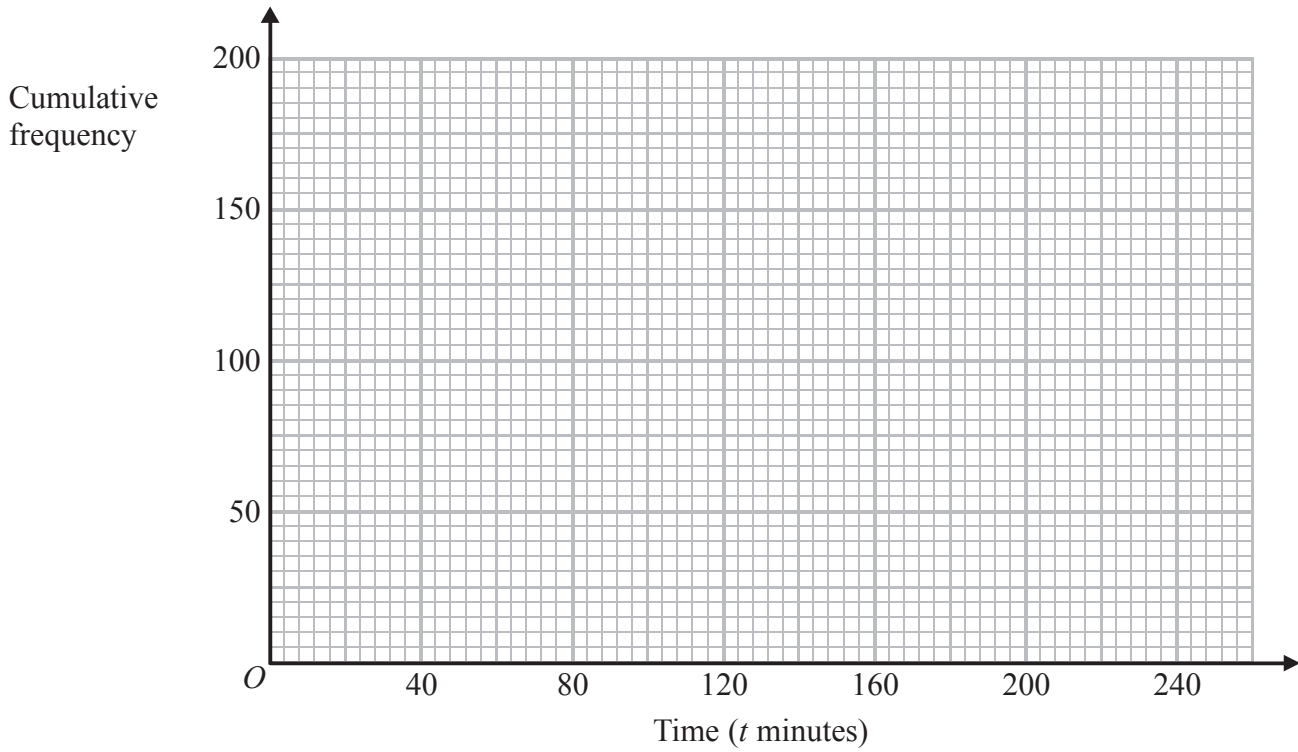
(2)

(c) Use your graph to find an estimate for the lower quartile of the lengths of time the 160 students exercised.

.... minutes

(2)

(Total for Question 1 is 5 marks)

2 A particle moves along a straight line.
The fixed point O lies on this line.
The displacement of the particle from O at time t seconds is s metres, where

$$s = t^3 - 6t + 3$$

(a) Find an expression for the velocity, v m/s, of the particle at time t seconds.

$v = $ ....

(2)

(b) Find the acceleration of the particle at time 5 seconds.

.... m/s^2

(2)

(Total for Question 2 is 4 marks)

3 Make r the subject of the formula $A = 4r^2 - \pi r^2$ where r is positive.

$r = $ ....

(Total for Question 3 is 3 marks)

4

C

Diagram **NOT**
accurately drawn

8.3 cm

4.7 cm

7.5 cm

A

D

B
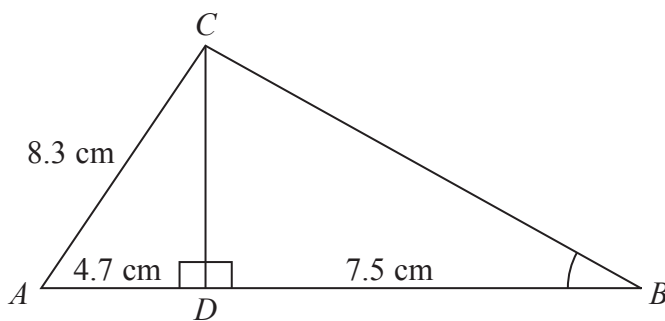
The diagram shows triangle *ABC*.
D is the point on *AB*, such that *CD* is perpendicular to *AB*.
AC = 8.3 cm.
AD = 4.7 cm.
BD = 7.5 cm.

Calculate the size of angle *ABC*.
Give your answer correct to 1 decimal place.

.........................°

(Total for Question 4 is 4 marks)

5   Given that x and y are positive integers such that $(1 + \sqrt{x})(3 + \sqrt{x}) = y + 4\sqrt{5}$
find the value of x and the value of y.

$x =$ ....

$y =$ ....

(Total for Question 5 is 3 marks)

6 Simplify fully $\dfrac{x^2 - 16}{x^2 - 6x + 8}$

....

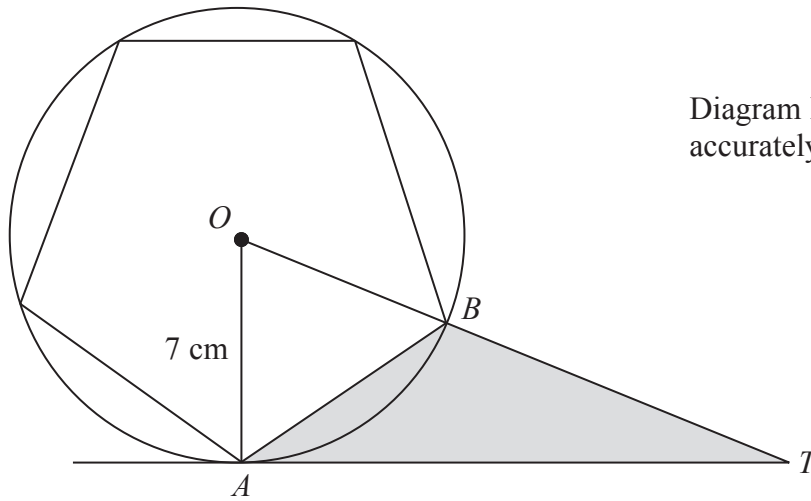**(Total for Question 6 is 3 marks)**

7

Diagram **NOT** accurately drawn

7 cm

The diagram shows a regular pentagon inside a circle, centre O.
The points A and B lie on the circle such that AB is a side of the pentagon.
$OA = 7$ cm.
TA is a tangent to the circle and OBT is a straight line.

Calculate the area of triangle ABT.
Give your answer correct to 3 significant figures.

.... cm^2

(Total for Question 7 is 5 marks)

8 The functions f and g are such that $f(x) = x + 3$ and $g(x) = \dfrac{1}{x - 2}$

(a) Find fg(x)

Give your answer as a single algebraic fraction expressed as simply as possible.

....

(3)

(b) Express the inverse function g^{-1} in the form $g^{-1}(x) = \ldots$

$g^{-1}(x) =$ ....

(3)

(Total for Question 8 is 6 marks)

9 Peter wants to pass his driving test.
The probability that he passes at his first attempt is 0.7
When Peter passes his driving test, he does not take it again.
If he fails, the probability that he passes at the next attempt is 0.8

(a) Complete the probability tree diagram for Peter's first two attempts.

First attempt   Second attempt

          Pass
    0.7

....
          Fail
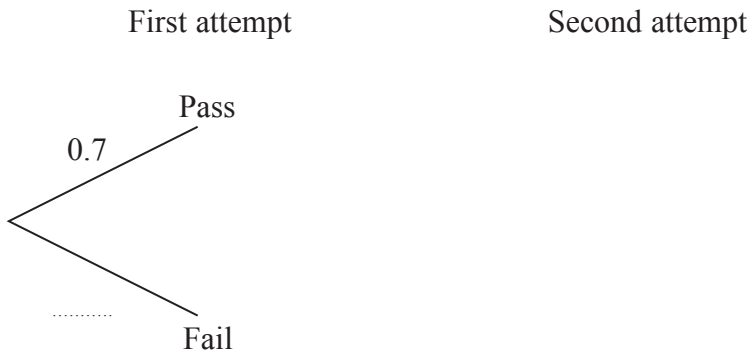
(2)

(b) Calculate the probability that Peter needs exactly two attempts to pass his driving test.

....
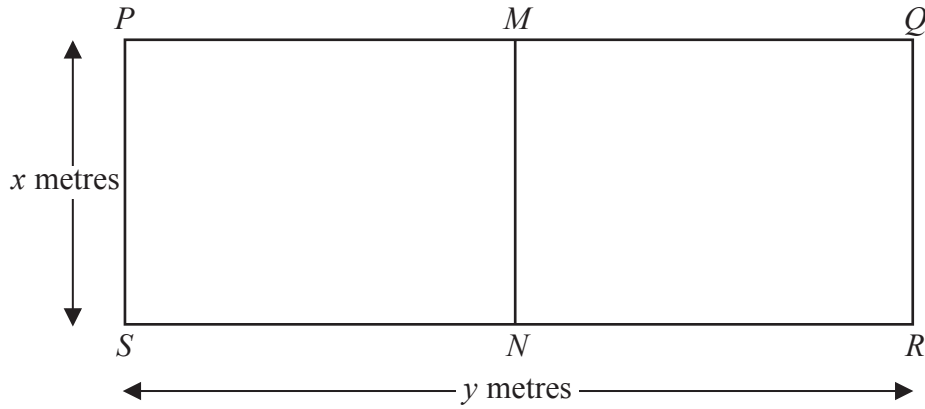
(2)

(c) Calculate the probability that Peter passes his driving test at his third or fourth attempt.

....

(3)

(Total for Question 9 is 7 marks)

10 A farmer has 120 metres of fencing.
He is going to make a rectangular enclosure *PQRS* with the fencing.
He is also going to divide the enclosure into two equal parts by fencing along *MN*.

The width of the enclosure is *x* metres.
The length of the enclosure is *y* metres.

(a) (i)   Show that $y = 60 - 1.5x$

The area of the enclosure *PQRS* is *A* m²

(ii)   S   that $A = 60x - 1.5x^2$

(3)

(b) Find $\dfrac{\mathrm{d}A}{\mathrm{d}x}$

....

(2)

(c) Find the maximum value of *A*.

$A = $ ....

(3)

(Total for Question 10 is 8 marks)