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17 The straight line **L** passes through the points  $(4, -1)$  and  $(6, 4)$

The straight line **M** is perpendicular to **L** and intersects the  $y$ -axis at the point  $(0, 8)$

Find the coordinates of the point where **M** intersects the  $x$ -axis.

(....., .....) )

**(Total for Question 17 is 4 marks)**



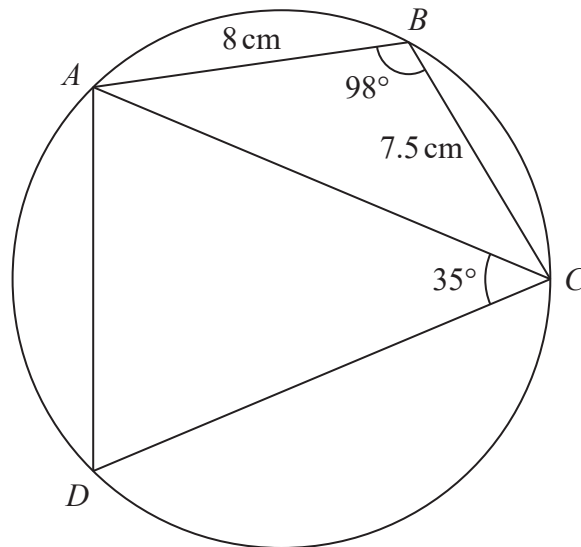


Diagram **NOT**  
accurately drawn

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$ABCD$  is a quadrilateral where  $A$ ,  $B$ ,  $C$  and  $D$  are points on a circle.

$$AB = 8\text{ cm}$$

$$BC = 7.5\text{ cm}$$

$$\text{Angle } ABC = 98^\circ$$

$$\text{Angle } ACD = 35^\circ$$

Work out the perimeter of quadrilateral  $ABCD$ .

Give your answer correct to one decimal place.



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..... cm

**(Total for Question 18 is 6 marks)**



P 6 5 9 1 8 A 0 2 1 2 8

19 Solve the simultaneous equations

$$\begin{aligned}y &= 3 - 2x \\x^2 + y^2 &= 18\end{aligned}$$

Show clear algebraic working.

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(Total for Question 19 is 5 marks)



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20 Mathematically similar wooden blocks are made in a workshop.

There are small blocks and there are large blocks.

The volume of each small block is  $300 \text{ cm}^3$

Given that

$$\text{the surface area of each small block : the surface area of each large block} = 25 : 36$$

work out the volume of each large block.

.....  $\text{cm}^3$

(Total for Question 20 is 3 marks)



P 6 5 9 1 8 A 0 2 3 2 8

21 The point  $A$  is the only stationary point on the curve with equation  $y = kx^2 + \frac{16}{x}$  where  $k$  is a constant.

Given that the coordinates of  $A$  are  $\left(\frac{2}{3}, a\right)$

find the value of  $a$ .

Show your working clearly.

$a = \dots\dots\dots$

(Total for Question 21 is 5 marks)

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- 22 The curve **S** has equation  $y = f(x)$  where  $f(x) = x^2$   
The curve **T** has equation  $y = g(x)$  where  $g(x) = 2x^2 - 12x + 13$

By writing  $g(x)$  in the form  $a(x - b)^2 - c$ , where  $a$ ,  $b$  and  $c$  are constants,  
describe fully a series of transformations that map the curve **S** onto the curve **T**.

.....

.....

.....

(Total for Question 22 is 4 marks)



23 Pippa has a box containing  $N$  pens.

There are only black pens and red pens in the box.

The number of black pens in the box is 3 more than the number of red pens.

Pippa is going to take at random 2 pens from the box.

The probability that she will take a black pen **followed** by a red pen is  $\frac{9}{35}$

Find the possible values of  $N$ .

Show clear algebraic working.





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**(Total for Question 23 is 5 marks)**

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**TOTAL FOR PAPER IS 100 MARKS**



P 6 5 9 1 8 A 0 2 7 2 8