HIGHER TIER
MINI PRACTICE EXAM 6

CALCULATOR ALLOWED
20 MINUTES ALLOWED

metatutor

1.
A circle has equation $x^2 + y^2 = 81$.

(a) Write down the co-ordinates of the centre of the circle.

(0, 0)

(1)

(b) Write down the length of the radius of the circle.

9

(1)

2.
Make Q the subject of the equation

$$\sqrt{\frac{3Q + M}{T}} = X$$

$\frac{3Q+M}{T} = X^2$

$\times T \quad 3Q+M = TX^2$

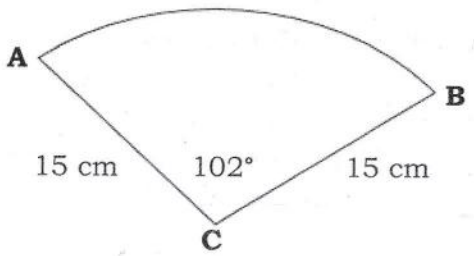
$-M \quad -M$

$\div 3 \quad 3Q = TX^2 - M \quad \div 3$

$Q = \frac{TX^2 - M}{3}$

(3)

3.
ABC is a sector of a circle.



(a) Find the area of the sector ABC. Give your answer to 3 significant figures.

$\pi \times 15^2 \times \frac{102}{360} = 200.27\ldots = 200\ cm^2$

(2)

(b) Find the perimeter of the sector ABC. Give your answer to 3 significant figures.

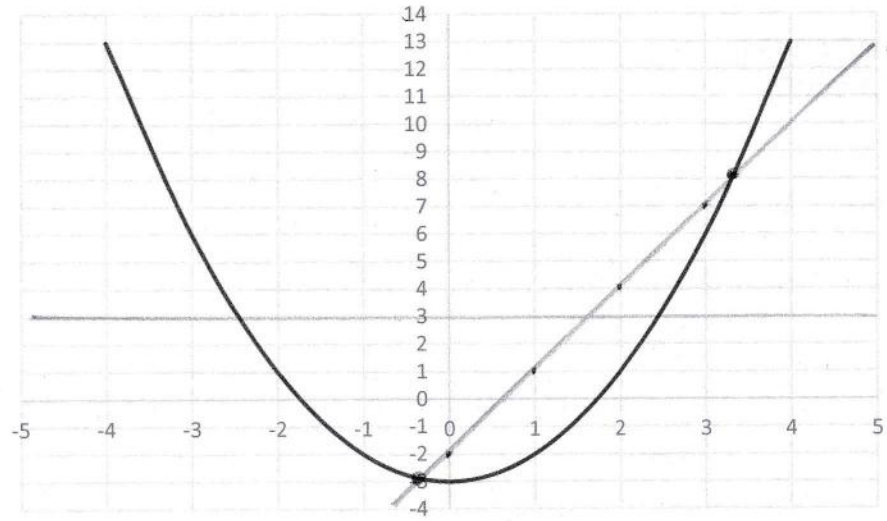
$\pi \times 15 \times 2 \times \frac{102}{360} = 26.703\ldots$

$26.7\ldots + 15 + 15 = 56.7\ cm$

(2)

4.

Below is the graph $y = x^2 - 3$.



(a) Use the graph to estimate the solutions of $x^2 - 3 = 0$.

1.75 and −1.75

(1)

(b) Use the graph to estimate the solutions of $x^2 = 6$.

2.4 and −2.4

(2)

(c) By drawing an appropriate straight line, estimate the solutions of $x^2 - 3x - 1 = 0$.

$x^2 - 3x - 1 = 0$

$x^2 - 3x - 3 = -2$

$x^2 - 3 = 3x - 2$

3.3 and −0.3

(4)

5.

The maximum capacity of a bridge is 11,500 tonnes, to the nearest 100 tonnes.
The average mass of a car is 2 tonnes, to the nearest tonne.
Mark says "The bridge can hold 7,800 cars at a time".
Using an error interval, show that Mark is definitely incorrect.

UB (capacity) = 11,550

LB (mass of car) = 1.5 tonnes

UB (number of cars) = 11,550 ÷ 1.5

= 7,700 cars.

Mark is definitely incorrect, because the upper bound of the number of cars possible is 7,700.

(4)