AQA – Trigonometry – AS Mathematics P1

1. June/2020/Paper_1/No.3

Jia has to solve the equation

$$2 - 2\sin^2\theta = \cos\theta$$

where $-180° \leq \theta \leq 180°$

Jia's working is as follows:

$$2 - 2(1 - \cos^2\theta) = \cos\theta$$
$$2 - 2 + 2\cos^2\theta = \cos\theta$$
$$2\cos^2\theta = \cos\theta$$
$$2\cos\theta = 1$$
$$\cos\theta = 0.5$$
$$\theta = 60°$$

Jia's teacher tells her that her solution is incomplete.

(a) Explain the **two** errors that Jia has made.

[2 marks]

(b) Write down all the values of θ that satisfy the equation

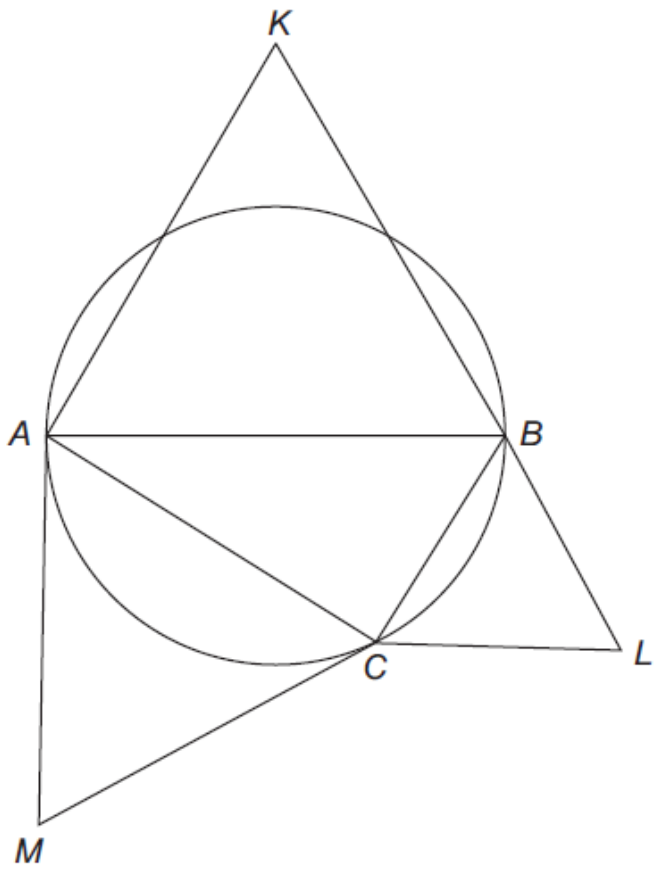
$$2 - 2\sin^2\theta = \cos\theta$$

where $-180° \leq \theta \leq 180°$

[2 marks]

2. June/2020/Paper_1/No.9

The diagram below shows a circle and four triangles.



AB is a diameter of the circle. *C* is a point on the circumference of the circle.

Triangles *ABK*, *BCL* and *CAM* are equilateral.

Prove that the area of triangle *ABK* is equal to the sum of the areas of triangle *BCL* and triangle *CAM*.

[5 marks]

3. June/2019/Paper_1/No.1

State the number of solutions to the equation $\tan 4\theta = 1$ for $0° < \theta < 180°$

Circle your answer.

[1 mark]

1 2 4 8

4. June/2019/Paper_1/No.6

(a) (i) Show that $\cos\theta = \frac{1}{2}$ is one solution of the equation

$$6\sin^2\theta + 5\cos\theta = 7$$

[2 marks]

(a) (ii) Find all the values of θ that solve the equation

$$6\sin^2\theta + 5\cos\theta = 7$$

for $0° \leq \theta \leq 360°$

Give your answers to the nearest degree.

[2 marks]

(b) Hence, find all the solutions of the equation

$$6\sin^2 2\theta + 5\cos 2\theta = 7$$

for $0° \leq \theta \leq 360°$

Give your answers to the nearest degree.

[2 marks]