

2. Some A level students were given the following question.

Solve, for $-90^\circ < \theta < 90^\circ$, the equation

$$\cos \theta = 2 \sin \theta$$

The attempts of two of the students are shown below.

Student A

$$\cos \theta = 2 \sin \theta$$

$$\tan \theta = 2$$

$$\theta = 63.4^\circ$$

Student B

$$\cos \theta = 2 \sin \theta$$

$$\cos^2 \theta = 4 \sin^2 \theta$$

$$1 - \sin^2 \theta = 4 \sin^2 \theta$$

$$\sin^2 \theta = \frac{1}{5}$$

$$\sin \theta = \pm \frac{1}{\sqrt{5}}$$

$$\theta = \pm 26.6^\circ$$

- (a) Identify an error made by student A.

(1)

Student B gives $\theta = -26.6^\circ$ as one of the answers to $\cos \theta = 2 \sin \theta$.

- (b) (i) Explain why this answer is incorrect.

(ii) Explain how this incorrect answer arose.

(2)