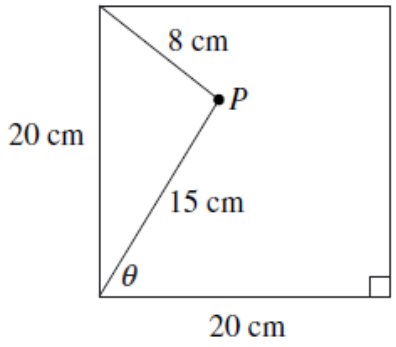
2016 **12 c** **3**

Square tiles of side length 20 cm are being used to tile a bathroom.
The tiler needs to drill a hole in one of the tiles at a point P which is 8 cm from one corner and 15 cm from an adjacent corner.
To locate the point *P* the tiler needs to know the size of the angle θ shown in the diagram.
Find the size of the angle θ to the nearest degree.



NOT TO SCALE

Consider α. Using the cosine rule:

$$\cos\alpha = \frac{20^2 + 15^2 - 8^2}{2(20)(15)}$$

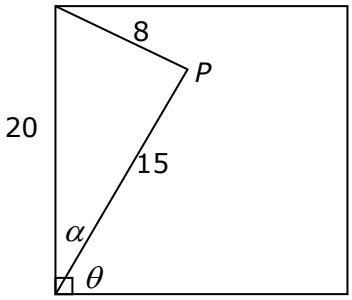
$$= 0.935$$

$$\alpha = 20.77185505\ldots$$

$$= 21 \text{ (nearest whole)}$$

$$\therefore \theta = 90 - 21 \ (\angle \text{ in square})$$

$$= 69$$



State Mean: **2.27**

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by BOSTES.

BOSTES: Notes from the Marking Centre

Most candidates recognised the need to use trigonometry involving the use of the cosine rule and identifying complementary angles. Common problems were:

- assuming that angle $\angle P$ was a right angle
- finding the obtuse $\angle P$ and not knowing how to proceed
- re-arranging the cosine rule incorrectly.