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2015 12 d For what values of k does the quadratic equation $x^2 - 8x + k = 0$ have real roots?

2

$\Delta \geq 0$ for real roots.

If $x^2 - 8x + k = 0$,

$$\Delta = b^2 - 4ac$$

$$= (-8)^2 - 4 \times 1 \times k$$

$$= 64 - 4k \geq 0$$

$$64 - 4k \geq 0$$

$$4k \leq 64$$

$$k \leq 16$$

State Mean:
1.19

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by BOSTES.

Board of Studies: Notes from the Marking Centre

(d) This part was challenging. Most candidates who attempted this part realised that they needed to use the discriminant.

Common problems were:

- not using the correct expression for the discriminant
- not recognising that a quadratic equation has real roots when $\Delta \geq 0$
- making careless algebraic errors when solving an inequality.