Question-7-7.2-26

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Question:
The centre of circle is $(2a, a-7)$. Find the values of a if the circle passes through the point $\mathbf{A}\,(11,-9)$and has diameter $10\sqrt{2}$ units
Solution:
The radius of circle is $5\sqrt{2}$

Point	Coordinates
A	$(2a, 4)$
B	$(-2, 3b)$
C	$(1, 2a+1)$

TABLE 0: variables used

Let the centre of the circle be **C**

$$\|\mathbf{A}-\mathbf{C}\| = 5\sqrt{2} \tag{0.1}$$

$$\mathbf{A}-\mathbf{C} = \begin{pmatrix} 11-2a \\ -2-a \end{pmatrix} \tag{0.2}$$

$$(11-2a)^2 + (2+a)^2 = 50 \tag{0.3}$$

$$a^2 - 8a + 15 = 0 \tag{0.4}$$

$$(a-3)(a-5) = 0 \tag{0.5}$$

$$Therefore a = 3 or a = 5 \tag{0.6}$$