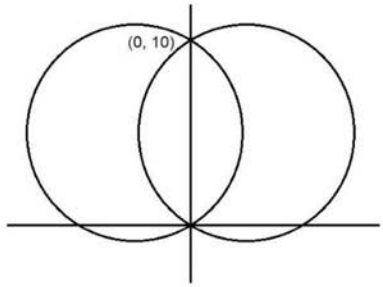
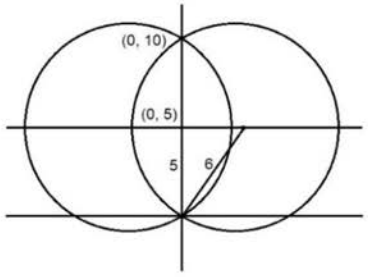
| Q 8 | Marking Instructions | AO | Marks | Typical Solution |
|---|---|---|---|---|
| (a) | Produces a combined diagram showing circles intersecting at origin and (0, 10) or two separate diagrams. Allow reasonable 'hand drawn' circles which illustrate symmetry. Circles must cut the $x$ axis again. Do not accept circles that go off the page. | AO2.2a | B1 |   |
| (b) | Deduces that $y$ coordinate of centre is 5. (PI by any use of $(y - 5)$ in any circle equation or marked on diagram or seen as a y coordinate or used in Pythagoras) | AO2.2a | B1 |   |
| | Forms correct equation for $x$ coordinate of centres using Pythagoras (PI) | AO1.1a | M1 | $6^2 = 5^2 + a^2$ $a = +\sqrt{11}$ or $-\sqrt{11}$ |
| | Obtains two correct circle equations (either form)<br><br>Condone 3.3 or better provided $a = \sqrt{11}$ seen earlier | AO1.1b | A1 | $(x - \sqrt{11})^2 + (y - 5)^2 = 6^2 = 36$ Or $(x + \sqrt{11})^2 + (y - 5)^2 = 6^2 = 36$ $x^2 + 2\sqrt{11}x + y^2 - 10y = 0$ $x^2 - 2\sqrt{11}x + y^2 - 10y = 0$ |
| | **Total** | | **4** | |