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| **24** | $\frac{-5-10}{4--2}\ (=-\frac{5}{2})$ | | 6 | M1 | A correct method to find the gradient of *AC* |
| | $y-10=-\frac{5}{2}(x+2)$ oe eg $y=-\frac{5}{2}x+5$<br>or $y--5=-\frac{5}{2}(x-4)$ oe or $5x+2y=10$ oe | | | M1 | ft (if M1 scored) correct equation of *AC* |
| | $y-4=\frac{2}{5}(x--\frac{27}{5})$ oe or $4=\frac{2}{5}\left(-\frac{27}{5}\right)+c\ \left(y=\frac{2}{5}x+6.16\right)$<br>$\frac{4-y}{-\frac{27}{5}-x}=\frac{2}{5}$ oe or $5y-2x=\frac{154}{5}$ oe | | | M1 | ft (if first M1 scored)<br>equation of *BD* or correct equation using gradient of *BD* |
| | solves $-\frac{5}{2}x+5=\frac{2}{5}x+6.16$ oe<br>eg $\begin{matrix}10x+4y=20\\-10x+25y=154\end{matrix}$ oe, with operation of addition **or**<br>$\begin{matrix}25x+10y=50\\-4x+10y=61.6\end{matrix}$ oe, with operation of subtraction **or**<br>$x=\frac{5}{2}y-\frac{154}{10}$ oe or $y=\frac{2}{5}x+\frac{154}{25}$ oe substituted in other equation | | | M1 | Solve equation OR<br>Solve simultaneously the correct equations of lines of *AC* and *BD* or correct equation from gradient or other correct equation.<br>If elimination: same coefficient of *x* or *y* with suitable sign used to eliminate.<br>If substitution: *x* or *y* substituted into other equation. |
| | Coordinates of intersection of *AC* and *BD* : $x=-\frac{2}{5}$, $y=6$ | | | M1 | oe value of *x* and *y* at intersection of *AC* and *BD* |
| | *Correct answer scores full marks (unless from obvious incorrect working)* | (4.6, 8) | | A1 | oe coordinates of *D* |
| | **See next page for working with *AD = AB, CD = CB* or gradients** | | | | **Total 6 marks** |

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|---|---|---|---|---|
| **24** | eg $(10-4)^2+\left(-2+\frac{27}{5}\right)^2$ $(=47.56)$ ($AB = 6.896\ldots$) **or**<br>eg $(-5-4)^2+(4+\frac{27}{5})^2(=169.36)$ ($CB = 13.013\ldots$) **or**<br>eg $\frac{-5-10}{4--2}$ **or** $\frac{4-y}{-\frac{27}{5}-x}$ oe | | 6 | M1 A correct method to find $AB^2$ or $CB^2$<br>or<br>$AB$ or $CB$<br>or<br>a correct gradient expression for $AC$ or $DB$ |
| | eg $(y-10)^2+(x+2)^2=(10-4)^2+\left(-2+\frac{27}{5}\right)^2$ **or**<br>eg $(y+5)^2+(x-4)^2=(-5-4)^2+(4+\frac{27}{5})^2$ **or**<br>$\frac{-5-10}{4--2}\times\frac{4-y}{-\frac{27}{5}-x}=-1$ oe eg $-60+15y=6x+32.4$ | | | M1 Using $D$ $(x, y)$ form a correct equation<br>$AD^2= AB^2$<br>**or**<br>$CD^2= CB^2$<br>**or**<br>gradients $AC \times DB = -1$ (Using $D$ $(x, y)$) |
| | eg $2x - 5y = -30.8$ **or** $x = 2.5y - 15.4$ **or** $y = 0.4x + 6.16$ oe | | | M1 uses rearrangement or solving simultaneous equations to find a correct 3 term linear equation |
| | eg $(y-10)^2+(2.5y-15.4+2)^2=(10-4)^2+\left(-2+\frac{27}{5}\right)^2$<br>eg $(0.4x+6.16+5)^2+(x-4)^2=(-5-4)^2+(4+\frac{27}{5})^2$ | | | M1 uses substitution to obtain a correct quadratic equation in one unknown |
| | $7.25y^2 - 87y + 232 = 0$ oe or $1.16x^2 + 0.928x - 28.8144 = 0$ oe | | | M1 for a 3 term quadratic that can be used to find the value of $x$ or the value of $y$ at $D$ |
| | | (4.6, 8) | | A1 oe coordinates of $D$ |
| | | | | **Total 6 marks** |