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|---|---|---|---|---|---|---|
| **21** | $2(3y-1)^2+3y^2=11$ | $2x^2+3\left(\frac{x+1}{3}\right)^2=11$ | | 5 | M1 | substitution of linear equation into quadratic |
| | $21y^2-12y-9=0$ oe | $7x^2+2x-32=0$ oe | | | M1 | dep on previous M1 for multiplying out and collecting terms, forming a three term quadratic in any form of $ax^2 + bx + c$ (= 0) with at least 2 coefficients ($a$ or $b$ or $c$) correct |
| | eg $(7y+3)(y-1)=0$<br>$\frac{-(-12)\pm\sqrt{(-12)^2-4\times21\times(-9)}}{2\times21}$<br>$21\left[(y-\frac{2}{7})^2-\frac{4}{49}\right]-9=0$ oe<br>(gives $y=1, y=-\frac{3}{7}$) | eg $(7x+16)(x-2)=0$<br>$\frac{-(2)\pm\sqrt{(2)^2-4\times7\times-32}}{2\times7}$<br>$7\left[(x-\frac{1}{7})^2-\frac{1}{49}\right]-32=0$<br>(gives $x=2, x=-\frac{16}{7}$) | | | M1 | dep on M1 for solving **their** 3 term quadratic equation using any correct method (if factorising, allow brackets which expanded give 2 out of 3 terms correct ) (if using formula allow one sign error in subst terms and some simplification – allow as far as eg $\frac{12\pm\sqrt{144+756}}{42}$ or $\frac{-2\pm\sqrt{4+896}}{14}$ )(if completing the square allow as far as shown (allow error in final constant) **or** correct values for $x$ **or** correct values for $y$ |
| | eg $3\times1-1$ **and** $3\times-\frac{3}{7}-1$ | eg $\frac{2+1}{3}$ and $\frac{-\frac{16}{7}+1}{3}$ | | | M1ft | dep on previous M1 for substituting (must be shown) **their** 2 found values of $x$ or $y$ in a suitable equation (use 2dp or better for substitution) **or** fully correct values for the other variable (correct labels for $x$ / $y$) |
| | *Working required* | | $x=2, y=1$ **and** $x=-\frac{16}{7}, y=-\frac{3}{7}$ | | A1 | dep on M2 (allow coordinates) must be paired correctly allow $x = -2.28(57\ldots)$ and $y = -0.42(85\ldots)$ (even if obtained from premature rounding of the other variable.) |
| | | | | | | **Total 5 marks** |