9 A curve $y = \mathrm{f}(x)$ is such that $\mathrm{f}''(x) = (2x+5)^{-\frac{3}{2}}$.

The curve has gradient $\frac{2}{3}$ at the point (2, 2).

(a) Find the coordinates of the stationary point on the curve. [11]

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Continuation of working space for Question 9(a).

(b) Determine the nature of this stationary point. [1]

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10 Show that $\int_{\frac{\pi}{2}}^{\frac{3\pi}{2}} \left((\sin\theta+\cos\theta)^2+(\sin\theta-\cos\theta)^2\right)\mathrm{d}\theta = k\pi$, where k is an integer to be found. [5]

11 Solve the equation $(n-4)\,{}^{n+1}C_5 = {}^{n+2}C_7$. [3]

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