4 The equation of a curve is $y = \mathrm{f}(x)$, where $\mathrm{f}(x) = (2x-1)\sqrt{3x-2} - 2$. The following points lie on the curve. Non-exact values have been given correct to 5 decimal places.

$A(2, 4)$, $B(2.0001, k)$, $C(2.001, 4.00625)$, $D(2.01, 4.06261)$, $E(2.1, 4.63566)$, $F(3, 11.22876)$

(a) Find the value of k. Give your answer correct to 5 decimal places. [1]

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The table shows the gradients of the chords AB, AC, AD and AF.

Chord	AB	AC	AD	AE	AF
Gradient of chord	6.2501	6.2511	6.2608		7.2288

(b) Find the gradient of the chord AE. Give your answer correct to 4 decimal places. [1]

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(c) Deduce the value of $\mathrm{f}'(2)$ using the values in the table. [1]

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