

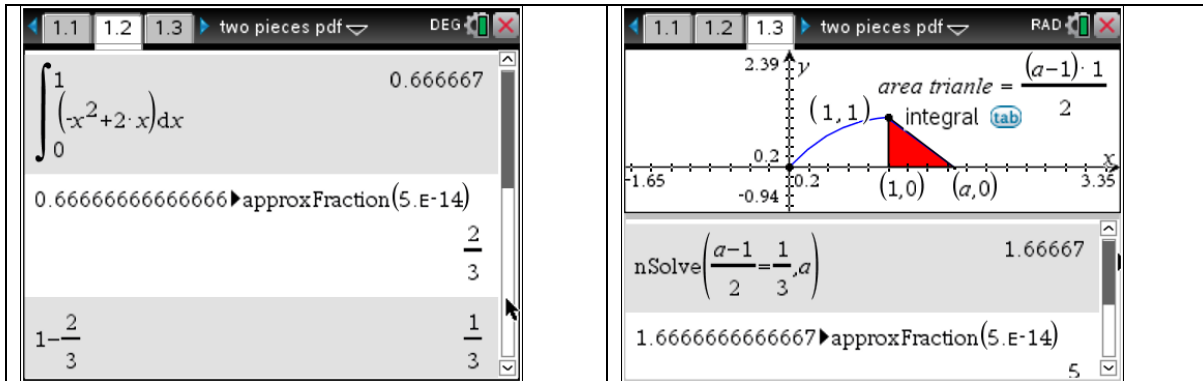
## PDF PIECEWISE FUNCTION WITH TWO PIECES

### Example:

Consider the probability density function:

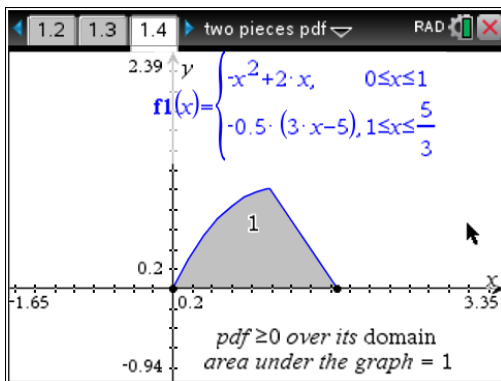
$$f(x) = \begin{cases} -x^2 + 2x, & 0 \leq x \leq 1 \\ -\frac{1}{2}(3x-5), & 1 < x \leq a \end{cases}$$

a) Determine the value of  $a$ .



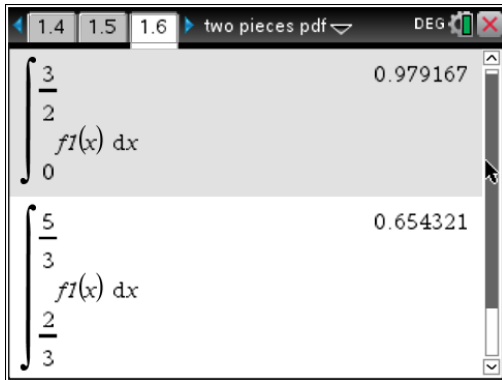
b) Sketch the graph of  $f(x)$ .

c) Justify that  $f(x)$  is a valid pdf.

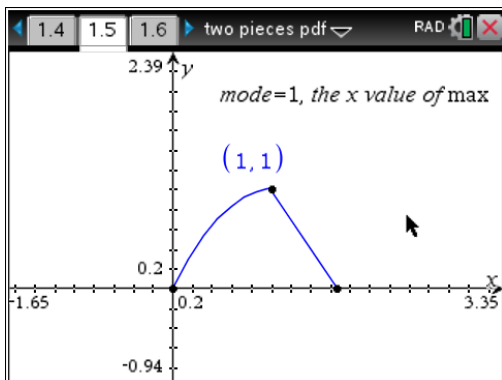


d) Calculate i)  $P\left(X < \frac{3}{2}\right)$

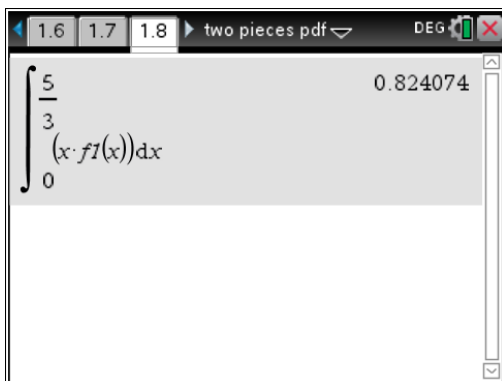
ii)  $P\left(X > \frac{2}{3}\right)$



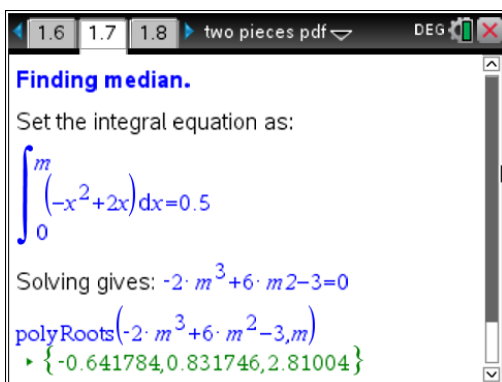
d) State the mode of the distribution.



e) Find the mean.



f) Find the mode.



median = 0.832 (the only solution in the given domain)