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Let  $\mathbb{Q}(\alpha, s)$  be the field of rational functions in  $\alpha, s$ . We compute the Kauffman polynomial of a given pretzel knot [?] [?] or rational knot using the Kauffman skein theory and linear algebra tools. Our calculation can be implemented in Mathematica, Maple, Mathcad, etc. such that for a pretzel knot, after inputting the sequence notation, the output is its Kauffman polynomial. (Received March 02, 2009)