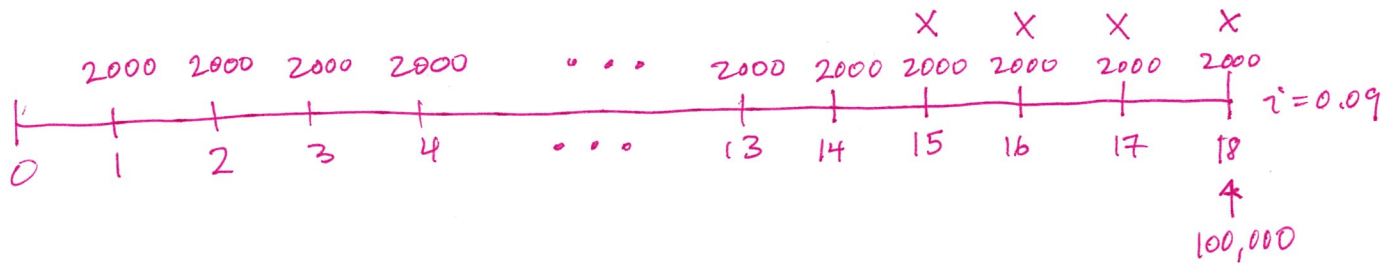


Name (print neatly): KEY Score: /20**Quiz 7: Thursday, March 5, 2015**

To receive full credit, show all work necessary to justify answers and all steps of proofs and derivations clearly, in logical sequence, using notation developed in class. Partial credit will be given only for significant progress toward a solution.

A family wishes to accumulate \$100,000 in a college fund at the end of 18 years. They plan to deposit \$2000 at the end of every year for 14 years and \$2000 + X at the end of each of the last 4 years. Find X if the fund earns 9% effective per annum.



$$2000 s_{\overline{18}|} + X s_{\overline{4}|} = 100,000$$

$$X s_{\overline{4}|} = 100,000 - 2000 s_{\overline{18}|}$$

$$X = \frac{100,000 - 2000 s_{\overline{18}|}}{s_{\overline{4}|}}$$

$$X = \frac{100,000 - 2000 \left(\frac{1.09^{18} - 1}{0.09} \right)}{\frac{1.09^4 - 1}{0.09}}$$

$$X = \frac{100,000(0.09) - 2000(1.09^{18} - 1)}{1.09^4 - 1}$$

$$X \approx \$ 3804.25$$