

1. (5 pts) (a) (2 pts) Write the following sum using summation notation:

$$2^2 + 4^2 + 6^2 + 8^2 + \dots + 98^2 + 100^2 =$$

(b) (3 pts) Find the precise value of the sum in part (a).

2. (6 pts) Sketch the graph of the function  $f(x) = \sin x$  on the interval  $[0, \pi]$ . Partition the interval  $[0, \pi]$  into four equal subintervals of equal length.

(a) (4 pts) Add to your sketch the rectangles associated with the right end-point Riemann sum,  $R_4^{right}$ , for this partition and write an expression for  $R_4^{right}$ . ( You could even compute the value of  $R_4^{right}$  but this is optional. )

(b)\* (2 pts) Is  $R_4^{right}$  an overestimate or an underestimate of the area below the graph of the function  $f(x) = \sin x$  on the interval  $[0, \pi]$ ? Briefly justify.