

Note from instructor: Parts (a), (b), and (d) are particularly relevant to QCR ILO 1

(1) Suppose  $S(t)$  is the number of inches of snow on the ground  $t$  hours after midnight.

(a) (6 pts) For each equation below, write a sentence describing the meaning. Include correct units.

(i)  $S(2) = 0.9$

(ii)  $S'(2) = 0.6$

(b) (4 pts) A student measures the amount of snow on the ground every two hours and records their measurements below. Use the table to estimate  $S'(6)$ .

$t$	0	2	4	6	8	10	12
$S(t)$	0	0.9	2.1	5.3	6.7	7.9	7.9

(c) (4 pts) Suppose  $S'(8) = 0.6$ . Write the equation of the tangent line to  $S(t)$  at  $t = 8$ .

(d) (3 pts) Use your equation from part (c) to estimate how much snow is on the ground when  $t = 9$ .

(e) (3 pts) Based on the table, which value is most likely to be larger,  $S'(4)$  or  $S'(10)$ ? Explain your reasoning.