

MTH 124.019 Quiz 5  
 Friday 19 February 2010

Name:

Show *all* your work. Points will be deducted for incomplete work. Write your answer in the box provided

1. A typical lung can hold about one litre of air. The volume of the lung,  $V$ , is a function of how much pressure the diaphragm puts on the lung,  $p$ . The *compliance*  $C(p)$  of the lung is the derivative of the volume, thought of as a function of the pressure. The following table records the volume of a lung as a function of the pressure from the diaphragm.

pressure (mm Hg)	7.3	11.0	14.7	18.4	22.1	25.8	29.5
volume (L)	1	0.95	0.86	0.70	0.49	0.29	0.20

- (a) What are the units of compliance?

- (b) What are the units of  $C'(p)$ ?

- (c) Describe the concavity of the graph of  $V(p)$ . Justify your answer in terms of the table above. (*Hint:* You may want to make a table of values of  $C(p)$  and  $C'(p)$ .)

2. "Blood is being lost, but the rate of blood loss is decreasing." Circle all of the graphs below which could be the amount of blood lost,  $B(t)$ , after  $t$  minutes.

