

**Student handout**

1. The voltage  $V$  (in volts) across a circuit is given by  $V = IR$  (Ohm's Law), where  $I$  is the current (in amps) flowing through the circuit and  $R$  is the resistance (in ohms). If we place two circuits, with resistance  $R_1$  and  $R_2$ , in parallel, then their combined resistance  $R$  is given by

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

Suppose the current is 2 amps and increasing at  $10^{-2}$  amp/sec and  $R_1$  is 3 ohms and increasing at 0.5 ohm/sec, while  $R_2$  is 5 ohms and decreasing at 0.1 ohm/sec. Calculate the rate at which the voltage is changing.