

2. (10 points) A smokestack deposits soot on the ground with a concentration inversely proportional to the square of the distance from the stack. With two smokestacks 20 miles apart, the concentration of the combined deposits on the line joining them, at a distance  $x$  from one stack, is given by

$$S = \frac{k_1}{x^2} + \frac{k_2}{(20 - x)^2}$$

where  $k_1$  and  $k_2$  are positive constants which depend on the quantity of smoke each stack is emitting. If  $k_1 = 7k_2$ , find the point on the line joining the stacks where the concentration of the deposit is a minimum.