(9) A uniform spring of force constant S is cut into two pieces whose lengths are the ratio of 1:3. calculate the force constant of each piece.

Solution — Here force $= F$

Increase in length $= l$

$$S = \frac{F}{l}$$

when the springs are cut in the ratio 1:3 in increase in length for the first piece for force will be $l/4$, and increase in length for the second piece will be $\frac{3l}{4}$.

$$S_1 = \frac{F}{l/4} = 4\left[\frac{F}{l}\right]$$

$$S_1 = 4S \quad \text{——— (i)}$$

$$S_2 = \frac{F}{3l/4} = \frac{4}{3}\left[\frac{F}{l}\right]$$

$$S_2 = \frac{4}{3}S \quad \text{——— (ii)}$$