

As the frequency varies inversely as the length of string:

$$f = \frac{K}{L}; L = \frac{K}{f}$$

Were:

f = frequency, L = long of string;

Let's find a coefficient of proportionality K:

$$40 = \frac{K}{680}; K = 40 * 680 = 27200;$$

$$L = \frac{K}{f} = \frac{27200}{850} = 32cm.$$

Answer: 32 cm.