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Garden Shed

The hypotenuse of the $\triangle$ that has two sides 60 and 120 is also the perpendicular of one of the side $\triangle$s. This length is $\sqrt{18000}$ m.

$\therefore$ the one of the wooden sides of the $\triangle = \sqrt{18000 + 14400}$
$$= \sqrt{32400}$$
$$= \sqrt{180} \text{ m}$$

$\therefore$ the 4 lengths come to 720 m.

The beam of wood connecting the two $\triangle$s has a length $300 - 240 = 60$ m

$\therefore$ All together the length is $720 + 60 = 780$ m.

If the length of in red was x, then the total length of wood is:
$4\sqrt{x^2 + 18000} + 60$.

This length would be the lowest when the slope of the function is 0. If we call the function $L(x)$, then

$$\frac{d(L(x))}{dx} = \frac{d(4\sqrt{x^2 + 18000} + 60)}{dx}$$

$$= \frac{4}{\sqrt{x^2 + 18000}} + 2x$$

When this comes to 0, then the minimum length is achieved.