QUESTION:

Over all real numbers, find the minimum value of a positive real number, y such that
y = sqrt((x+6)^2 + 25) + sqrt((x-6)^2 + 121)

SOLUTION:

$$y = \sqrt{(x+6)^2 + 25)} + \sqrt{(x-6)^2 + 121}$$

$$y = [(x+6)^2 + 25]^{1/2} + [(x-6)^2 + 121]^{1/2}$$

$$\frac{dy}{dx} = \frac{x+6}{\sqrt{(x+6)^2+25}} + \frac{x-6}{\sqrt{[(x-6)^2+121}} = 0$$

There would always be a value of *y* for all values of *x* over all integer planes.
However, the minimum value of *y* exists at *x = 0* which is the smallest positive real number.

@ $x = 0$;

$$y = \sqrt{(0+6)^2 + 25} + \sqrt{(0-6)^2 + 121}$$
$$y = \sqrt{61} + \sqrt{157}$$
$$y = 20.34$$