$$-12x^2 + 600x = 0$$

$$x(-12x + 600) = 0$$

$x = 0$ eller $600 = 12x$

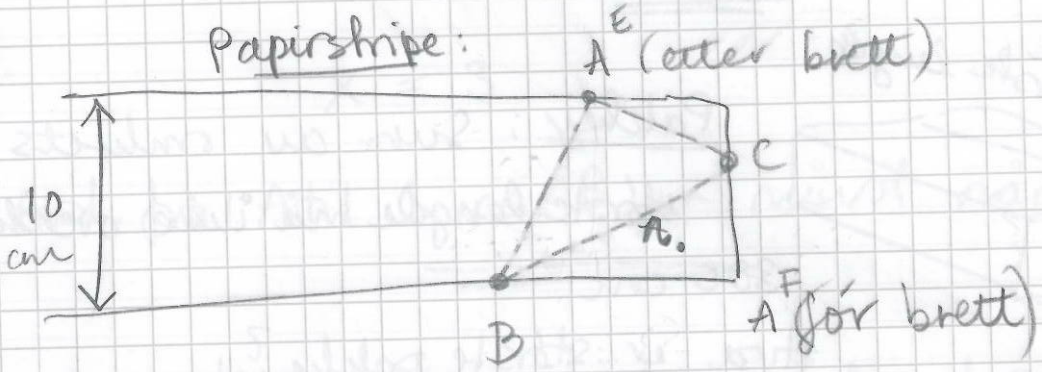
$x = 50$

må være minimum! Gir volum 0

Så $50 \text{ cm} \times 50 \text{ cm} \times 50 \text{ cm}$ kvadratiske pakke er det største man kan sende.

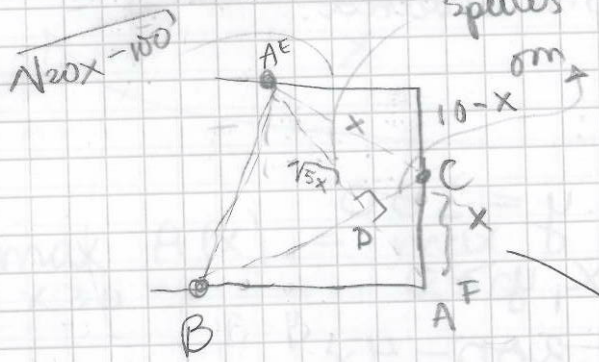
17)

Papirstripe:



Vil ha BC kortest mulig. Hva er minste mulige lengde på BC?

$\Delta A^E BC$ og $\Delta A^F BC$ er kongruente.



$$y^2 + (10-x)^2 = x^2$$

$$y^2 + 100 - 20x + x^2 = x^2$$

$$y^2 = 20x - 100$$

$$y = \sqrt{20x - 100}$$

$$|A^E A^F|^2 = 10^2 + 20x - 100$$

$$|A^E A^F| = 2\sqrt{5}\sqrt{x}$$

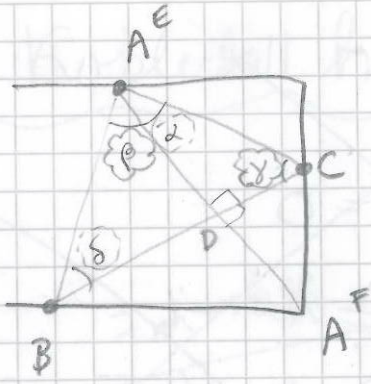
$$|A^F D| = |A^F D| = \sqrt{5}\sqrt{x}$$

Fra fig:

$x > 10 - x$

$2x > 10$

$x > 5$



$\alpha+\beta=90^\circ \rightsquigarrow \alpha=90^\circ-\beta$

$\left.\begin{array}{l}\alpha+90^\circ+\gamma=180^\circ\\ \beta+\delta+90^\circ=180^\circ\end{array}\right\}\ \begin{array}{l}\alpha+\gamma=90^\circ\\ \beta+\delta=90^\circ\end{array}$

$90^\circ-\beta+\gamma=90^\circ$

$\gamma=\beta$

$90^\circ-\alpha+\delta=90^\circ$

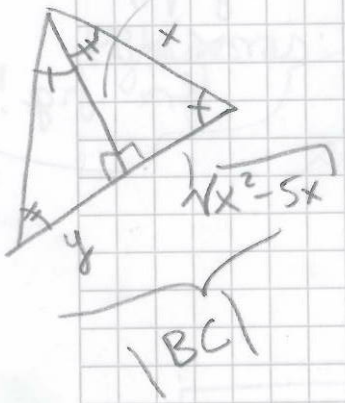
$\alpha=\delta$

$\Rightarrow \triangle A^E DC$ er formlik med $\triangle BDA^E$!

$5x+|DC|^2=x^2$

$|DC|^2=x^2-5x$

$|DC|=\sqrt{x^2-5x}$



$$\frac{y}{\sqrt{5x}}=\frac{\sqrt{5x}}{\sqrt{x^2-5x}}$$

$$y=\frac{5x}{\sqrt{x^2-5x}}$$

$|BC|$

$$|BC|=\frac{5x}{\sqrt{x^2-5x}}+\sqrt{x^2-5x}$$

$$=\frac{5x+x^2-5x}{\sqrt{x^2-5x}}$$

$$=\frac{x^2}{\sqrt{x^2-5x}}$$

$\min_x |BC|$

Deriverer & setter lik 0:

$(x^{-\frac{1}{2}})'=-\frac{1}{2}x^{-\frac{3}{2}}$

$$2x\frac{1}{\sqrt{x^2-5x}}+x^2\left(-\frac{1}{2}\right)\frac{1}{(x^2-5x)^{\frac{3}{2}}}(2x-5)=0$$

$$2x-\frac{x^2}{2}\frac{2x-5}{x^2-5x}=0$$

$$\frac{4x(x^2-5x)-2x^3+5x^2}{2(x^2-5x)}=0$$