Optimization Summary

1. Quiz from Wed
2. Optimization Assignment
3. Test - May 30th

If you have a given area, how can you optimize the perimeter of a rectangle?

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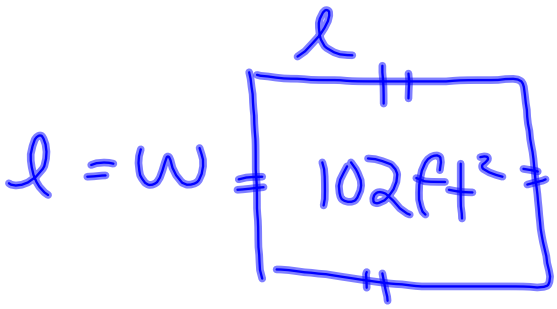
Create a square

e.g. If you need a rectangular enclosure to have area $102ft^2$, how can you optimize the perimeter?



$A = l \times w$

$102 = l \times l$

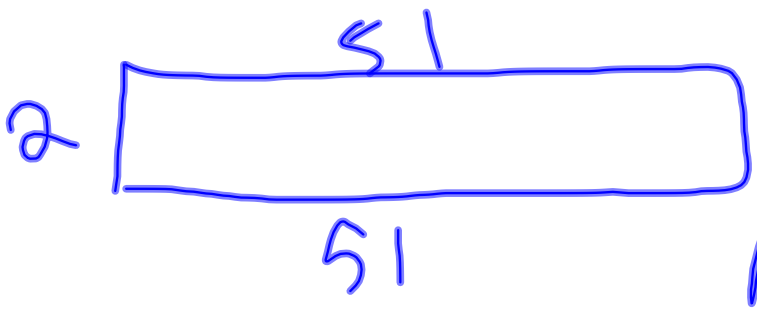
$102 = l^2$

$\sqrt{102} = l$

$10.09 \doteq l$

$P = 4 \times 10.09$

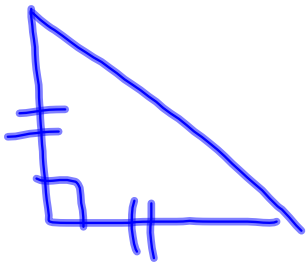
$= 40.36\ ft$



$P = 51 + 51 + 2 + 2$

$= 106\ ft$

If you have a given area, how can you optimize the perimeter of a right triangle?

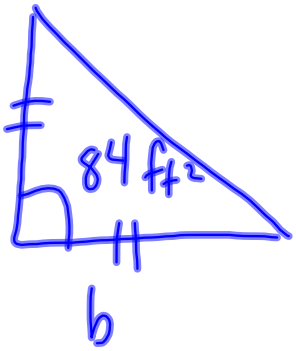


base = height

e.g. If you need a rectangular enclosure to have area 84ft^2, how can you optimize the perimeter?

$A = \frac{b \times h}{2}$

$b = h$



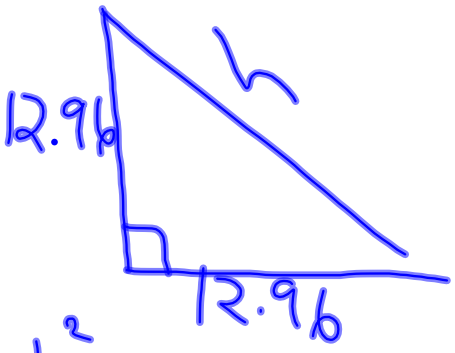
$84 = \frac{b \times b}{2}$

$168 = b \times b$

$168 = b^2$

$\sqrt{168} = b$

$12.96 = b$



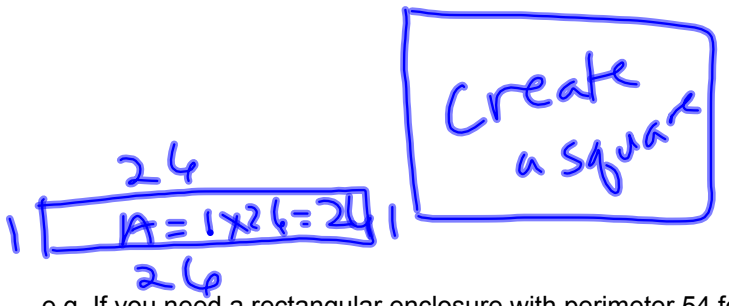
$h^2 = 12.96^2 + 12.96^2$

$= 18.33$

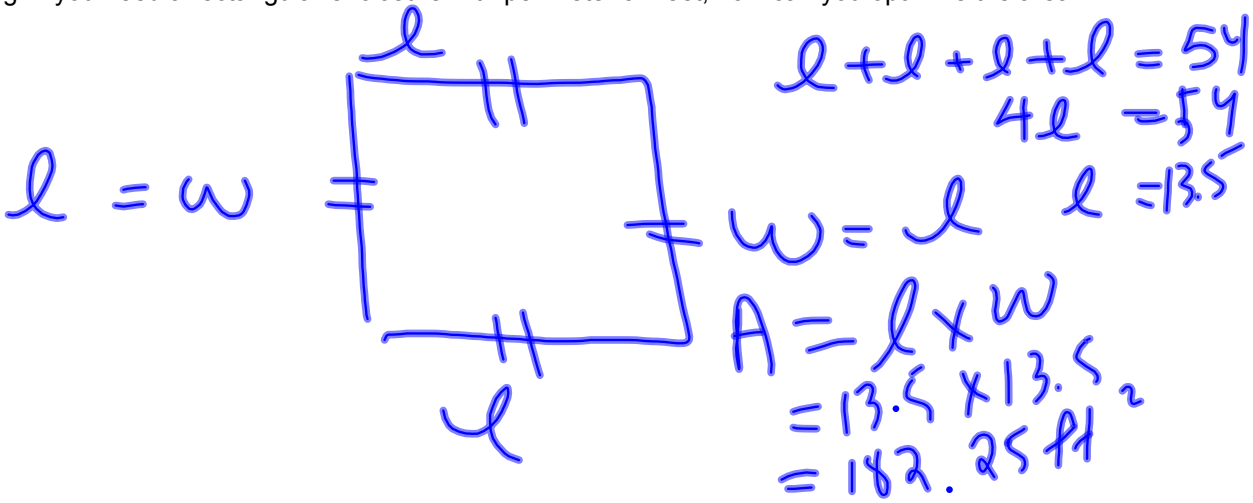
$P = 12.96 + 12.96 + 18.33$

$= 44.25$ ft

If you have a given perimeter, how can you optimize the perimeter of a rectangle?



e.g. If you need a rectangular enclosure with perimeter 54 feet, how can you optimize the area?



$A = \frac{b \times h}{2}$

$= \frac{1 \times 8.45}{2}$

$= 4.225$

$a^2 + b^2$

$= 1^2 + 8.4^2$

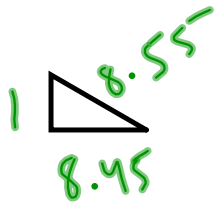
$= 71.56$

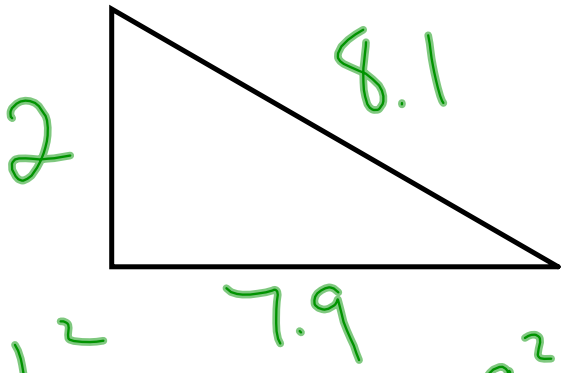
$c^2 = 8.6^2$

$= 73.96$

18 m

$P = 18$





$a^2 + b^2 = 2^2 + 7.7^2$
$= 63.29$
$8.3^2 = 68.89$

$a^2 + b^2$
$= a^2 + 7^2$
$= 53$

$a^2 + b^2$
$= a^2 + 7.5^2$
$= 61.7$

$c^2 = 8.5^2$
$= 72.25$