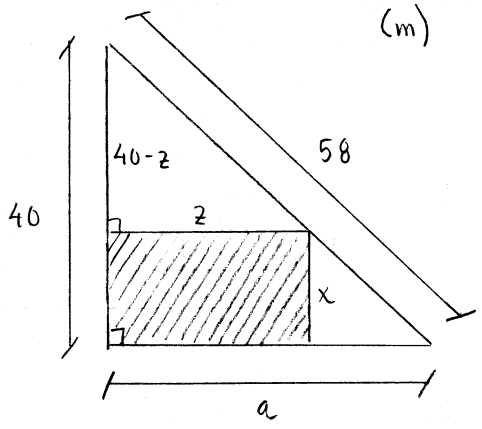
$\sqrt{58^2 - 40^2} = \sqrt{(58+40)(58-40)} = \sqrt{98 \cdot 18} = \sqrt{2 \cdot 49 \cdot 2 \cdot 9} = 2 \cdot 7 \cdot 3 = 42$

3219



Pythagoras sats ger triangelns bas:

$a = \sqrt{58^2 - 40^2} = 42$

Likformighet ger

$$\frac{z}{42} = \frac{40 - x}{40}$$

(a)

$$z = 42\left(1 - \frac{x}{40}\right) = 42 - 1{,}05x$$

Skuggade arean

$$A = x \cdot z = x \cdot (42 - 1{,}05x) = 42x - 1{,}05x^2$$

$$A(x) = 42x - 1{,}05x^2$$

Definitionsmängd

$$0 < x < 40$$

Derivatans nollställen?

$$A'(x) = 42 - 2{,}1x$$

$A'(x) = 0$ ger $42 - 2{,}1x = 0$

$$x = \frac{42}{2{,}1}$$

$$x = 20$$

Teckentabell

x	(0)		$\boxed{20}$		(40)
$A'(x)$		$+$	0	$-$	
$A(x)$		$\nearrow$	MAX	$\searrow$	

$A'(0) = 42 > 0$

$A'(100) = 42 - 2{,}1 \cdot 100 < 0$

Extremvärden

$$A(20) = 20(42 - 1{,}05 \cdot 20) = 20 \cdot 21 = 420$$

Svar: $420\ m^2$