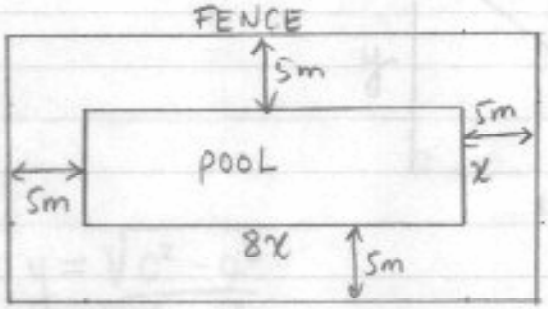
# POOL PARTY

Let:
$x$ represent the width of the pool
$8x$ represent the length of the pool




$54 < \text{perimeter} < 90$

$\text{perimeter} = 2(8x + x) = 18x$

## MINIMUM VALUE

$$\frac{54}{18} < \frac{18x}{18}$$

$$3 < x$$

→ so length is $8x = 8 \cdot 3 = 24\text{m}$
width is 3m
area of pool is $A = l \times w$
$A = 24 \times 3$
$A = 72\text{m}^2$

Cost of cover
= area of pool x cost/$m^2$
= $72\text{m}^2$ x \$40/$m^2$
= \$2880

Cost of fence
length of fence = $8x + 10$
$= 8(3) + 10 = 34\text{m}$
width of fence = $x + 10$
$= 3 + 10 = 13\text{m}$
total length of fence = $2(13 + 34) = 94\text{m}$
cost = \$50/m x 94m = \$4700

## MAXIMUM VALUE

$$\frac{90}{18} > \frac{18x}{18}$$

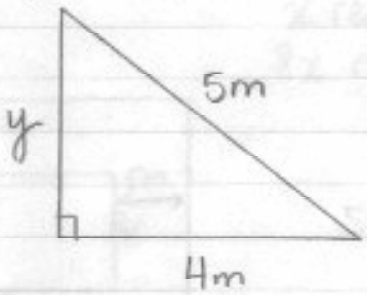
$$5 > x$$

→ so length is $8x = 8 \cdot 5 = 40\text{m}$
width is 5m
area of pool is $A = l \times w$
$A = 40 \times 5$
$A = 200\text{m}^2$

Cost of cover
= area of pool x cost/$m^2$
= 200 $m^2$ x \$40/$m^2$
= \$8000

Cost of fence
length of fence = $8x + 10$
$= 8(5) + 10 = 50\text{m}$
width of fence = $x + 10$
$= 5 + 10 = 15\text{m}$
total length of fence = $2(50 + 15) = 130\text{m}$
cost = \$50/m x 130m = \$6500

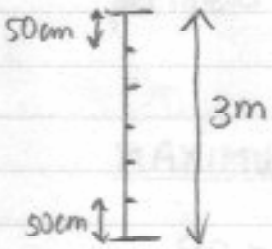
Cost to cover rungs




$y = \sqrt{c^2 - a^2}$

$y = \sqrt{5^2 - 4^2}$

$y = \sqrt{25 - 16} = 3m$




5 rungs are needed and have to be covered

Cost = number of rungs x cost per rung
= 5 x $10.75/rung
= $53.75

TOTAL COST = cost of cover + cost of fence + cost to cover rungs

MINIMUM COST = $2880 + $4700 + $53.75
= $7633.75

MAXIMUM COST = $8000 + $6500 + $53.75
= $14553.75

FINAL ANSWER

$7633.75 < TOTAL COST < $14553.75