③ $a = 45$, $a_n = 25$

no. of rungs $= \frac{250}{25} + 1$

$= 10 + 1$

$= 11$

$\therefore n = 11$

$S_{11} =$

$= \frac{n}{2}(a + l)$

$= \frac{11}{2}(45 + 25)$

$= \frac{11}{2} \times 70^{35}$

$= 11 \times 35$

$= 385$

$\therefore$ length of wood used for rungs

$= 385$ cm

$= 3.85$ m

④

$1, 2, 3, 4, \ldots, 47, 48, 49$

$1, 2, 3, \ldots, x-1, x$ (I AP), $x+1, \ldots, 49$ (II AP)

I AP	II AP
$a = 1$	$a' = x + 1$
$d = 2 - 1 = 1$	$d' = 1$
$n = x - 1$	$n' = 49 - x$
$S_n = \frac{x-1}{2}(1 + x - 1)$	$S_{n'} = \frac{49-x}{2}(x+1+49)$
$= \frac{x-1}{2} \times x$	$= \frac{(49-x)}{2} \times (x + 50)$
$= \frac{x(x-1)}{2}$	

acc to prob

$\frac{x(x-1)}{2} = \frac{(49-x)(x+50)}{2}$

$\Rightarrow x^2 - x = -x^2 - 50x + 49x + 2450$

$\Rightarrow x^2 - 1225 = 0$

$\Rightarrow x^2 - 35^2 = 0$

$\Rightarrow (x - 35)(x + 35) = 0$

$\Rightarrow x - 35 = 0, \; x + 35 = 0$

$\Rightarrow x = 35, \; x = -35$

$\therefore x = 35$