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Title: Quiz #1
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- required 2x4:

Perimeter = $l + 2w + \pi \cdot r$
$= 400 + 2 \cdot 500 + 200\pi$
$= (1400 + 200\pi)m$
$\approx 2028.32m$

1 segment = 1m

∴ we need 2029 segments, where one segment is ≈ 32 cm wide

- Vertical pieces: for regular segments

there are 11 2x4x5 vertical pieces per segment.

$11 \times 2028 = 22308$

0.32cm segment:

$?_{2\times4} = \frac{1\ plank}{3.5\ in} \cdot \frac{1\ in}{25.4mm} \cdot 320mm$
$= 3.60$

∴ rounding up, we need
$22308 + 4 = 22312\ (2\times4\times5')$
for vertical pieces:

- 2 vertical pieces (2x4x5') can be made from 1 (2x4x10')

∴ we need $\frac{22312}{2} = 11156\ (2\times4\times10')$ for vertical pieces

- Each horizontal segment requires:

$1m = \frac{1ft}{12in} \cdot \frac{1in}{25.4mm} \cdot \frac{10^3 mm}{m} \cdot 1m$
$= 3.28\ ft.$

∴ 3 pieces of 2x4x1m can be made from 1 piece of (2x4x10')

- we need:

$4 \times 2028 = 8112$ pieces of (2x4x1m)

uncut 2x4x10':

$= \frac{1\ (2\times4\times10')}{3\ (2\times4\times1m)} \cdot 8112\ (2\times4\times1m)$
$= 2704\ (2\times4\times10')$

in total, we need
$11156 + 2704 = 13860\ (2\times4\times10')$

in m, 1 2x4x10':

$\frac{0.0254m}{1in} \cdot 1.5in = 0.0381m$

$\frac{0.0254m}{1in} \cdot 3.5in = 0.0889m$

$\frac{0.0254m}{1in} \cdot 120in = 3.05m$

∴ $1\ (2\times4\times10') = 0.0381m \times 0.0889m \times 3.05m$

- to load trucks, stack (2x4x10') planks with the 10' side along the 3.5m length and the 2" side along the 1m side of the truck. this stacks:

$$26 \times 22 \times 1 = 572 \text{ pieces per truck}$$

Since we need: 13860 pieces of 2x4x10', we need:

$$\frac{13860}{572} = 24.2 \text{ trucks}$$

we need 24 full trucks and aid 1 partially loaded truck