M8 - 5.4 - Surface Area Missing Dimension Notes

Find the missing dimension of the following shapes.

$SA = 700\ cm^2$

8 cm

15 cm

$l = length$
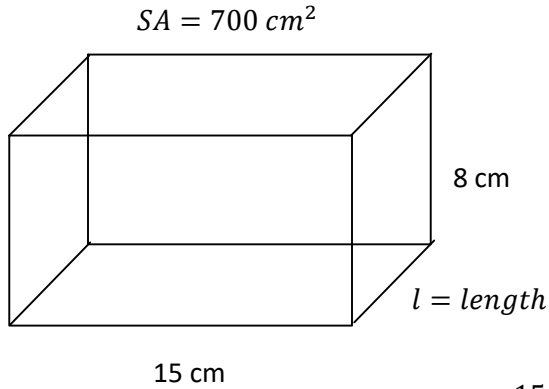
$SA = 2(l \times w) + 2(l \times h) + 2(h \times w)$
$700 = 2(15l) + 2(8l) + 2(8 \times 15)$
$700 = 30l + 16l + 240$
$-240 \qquad\qquad\qquad\quad -240$
$460 = 46l$
$\dfrac{460}{46} = \dfrac{46l}{46}$
$10 = l$

$\boxed{l = 10\ cm}$ (circled)

OR

$700 = 240 + 46l$
...

15

120

8

$8l$

$15l$

$8l$

l

8

120

8

$A = l \times w$

$15l$

$SA = 326.7\ m^2 = 104\pi\ m^2$

4 m

h
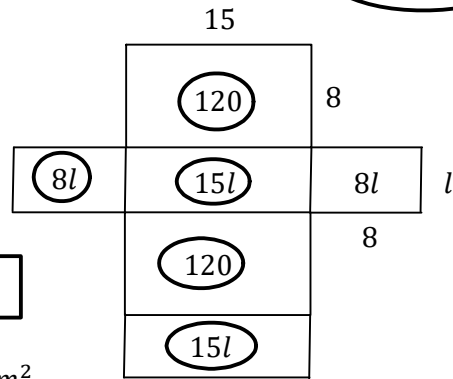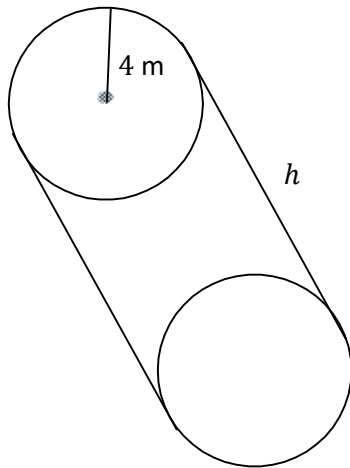
$SA = 2\pi r^2 + 2\pi rh$
$326.7 = 2\pi(4)^2 + 2\pi(4)h$
$326.7 = 100.53 + 25.13h$
$-100.53 - 100.53$
$26.17 = 25.13h$
$\dfrac{226.17}{25.13} = \dfrac{25.13h}{25.13}$
$9 = h$

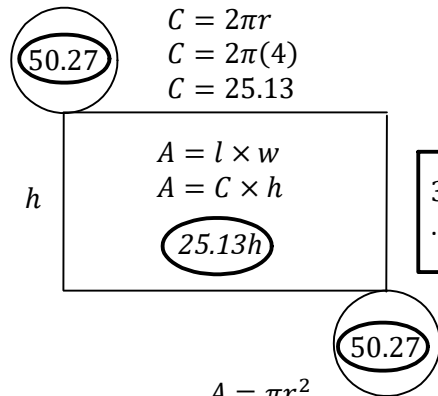$\boxed{h = 9\ m}$ (circled)

OR

$SA = 104\pi\ m^2$

$SA = 2\pi r^2 + 2\pi rh$
$104\pi = 2\pi(4)^2 + 2\pi(4)h$
$\dfrac{104\pi}{\pi} = \dfrac{32\pi}{\pi} + \dfrac{8\pi h}{\pi}$
$104 = 32 + 8h$
$-32 \quad -32$
$\dfrac{72}{8} = \dfrac{8h}{8}$

$\boxed{h = 9\ m}$ (circled)

$C = 2\pi r$
$C = 2\pi(4)$
$C = 25.13$

50.27

h

$A = l \times w$
$A = C \times h$

$25.13h$

50.27

$A = \pi r^2$
$A = \pi(4)^2$
$A = 50.27$

OR

$326.7 = 100.54 + 25.13h$
...

Area Page 1