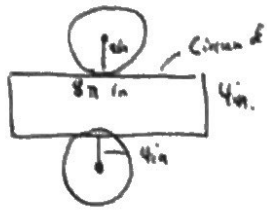
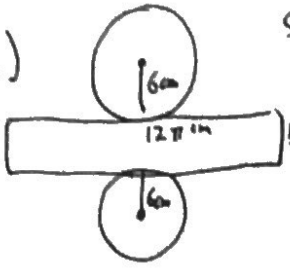
HW10 Solutions MA202: 12.2: #6, 8, 10ac, 14, 16, 22, 32, 33, 35, 36

12.2.6 a)



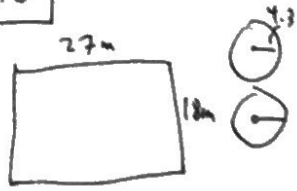
$SA = A_\bigcirc + A_\bigcirc + A_\square$
$= \pi r^2 + \pi r^2 + 2\pi r \cdot h$
$= 16\pi + 16\pi + 32\pi$
$= \boxed{64\pi \text{ in}^2}$
$\approx \boxed{200.96 \text{ in}^2}$

b)



$SA = 2\pi r^2 + 2\pi rh$
$= \pi 6^2 + \pi 6^2 + 12\pi \cdot 5$
$= 36\pi + 36\pi + 60\pi$
$= \boxed{132\pi \text{ cm}^2}$
$\approx \boxed{414.48 \text{ cm}^2}$

12.2.8



Need to find circumference of the small circles; the other length of the rectangle is the height.

$C = 2\pi \cdot r = 8.6\pi \approx 27$ m, so $\boxed{h = 18\text{m}}$

12.2.10

a)

$SA = \pi r^2 + \pi r l$
$= \pi(2)^2 + \pi(2)(5)$
$= 4\pi + 10\pi$
$= \boxed{14\pi \text{ in}^2}$
$\approx \boxed{43.96 \text{ in}^2}$

b) $r = 7$ ft. $\quad l = 12$ ft.

$SA = \pi r^2 + \pi r l$
$= \pi(7)^2 + \pi(7)(12)$
$= 49\pi + 84\pi$
$= \boxed{133\pi \text{ ft}^2}$
$\approx \boxed{417.62 \text{ ft}^2}$

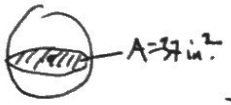
12.2.14

$A_{base} = 81\pi$ mm^2
$A_{lateral} = 135\pi$ mm^2.

Know $A_{base} = \pi r^2 = 81\pi$, so $r^2 = 81$, so $\boxed{r = 9 \text{ mm}}$

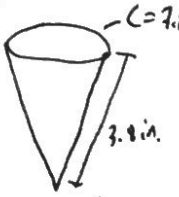
then, $A_{lateral} = \pi r l = 135\pi$, so $9l = 135$, so $\boxed{l = 15 \text{ mm}}$

12.2.16 Area of a central cross-section of a sphere is 37 in^2.



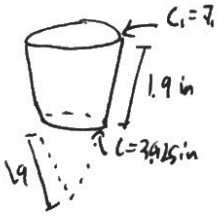
$SA_{sphere} = 4\pi r^2 = 4A = \boxed{148 \text{ in}^2}$

12.2.22



The cup has only lateral SA, so it has $SA = \pi r l = \frac{C}{2} l$, so $SA = \frac{7.85}{2} \cdot 3.8 = \boxed{14.915 \text{ in}^2}$

12.2.32



The cup's base has area πr^2 and $C = 2\pi r$, so $r = \frac{3.925}{2\pi} = 0.625$ in.

So $A_{base} = 1.23 \text{ in}^2$

The lateral SA will be the lateral SA of cone in 22 minus the lateral SA of the dashed cone which has $\frac{1}{2}$ the radius and $\frac{1}{2}$ the slant height, so $\frac{1}{4}$ the lateral SA = 3.73 in^2.

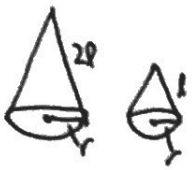
Thus $A_{lateral} = 11.186 \text{ in}^2$.

So total area = $11.186 + 1.23 = \boxed{12.41 \text{ in}^2}$

12.2.33 +2 +1 +1

No. The lateral SA is half of the original lateral SA, but the two new bases of each log have the same area as the original bases.

12.2.35



The larger cone does not have twice as much surface area. The lateral surface area doubles, but the base area is unchanged.

12.2.36

The larger sphere's surface area is Four times greater than the smaller sphere's.

$$SA_{big} = 4\pi(2r)^2 = 16\pi r^2 \qquad SA_{small} = 4\pi r^2$$

$$\frac{SA_{big}}{SA_{small}} = \frac{16\pi r^2}{4\pi r^2} = 4.$$
