

## Class / Homework

Practice Page 40 - 43

Questions :

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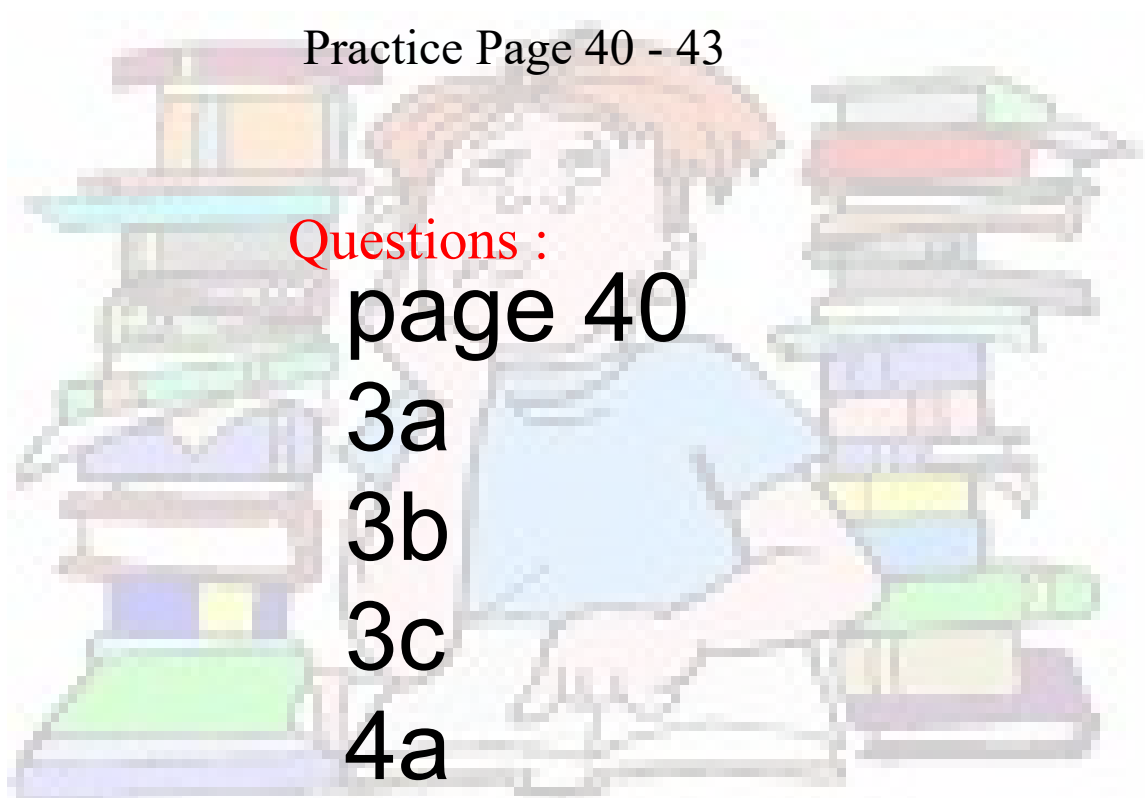
3a

3b

3c

4a

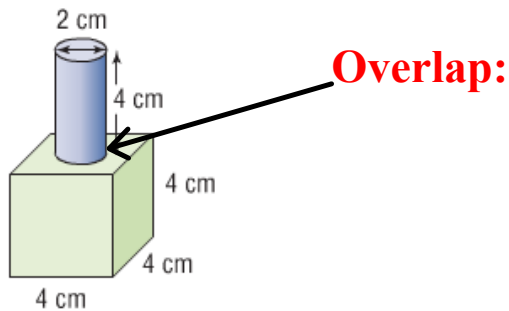
4b



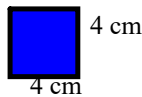
## Homework solutions

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3 a) cylinder on a cube



Cube



$$\begin{aligned} \text{area} &= 4\text{cm} \times 4\text{cm} \\ &= 16\text{ cm}^2 \end{aligned}$$

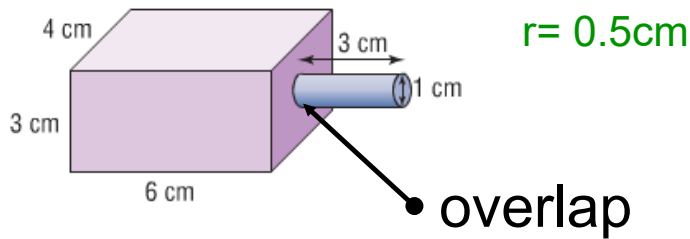
$$\begin{aligned} \text{Area} &= 6 \text{ faces} \times (\text{area of one face}) \\ &= 6 \times (16\text{ cm}^2) \\ &= 96\text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)(1\text{cm})^2 + 2(3.14)(1\text{cm})(4\text{cm}) \\ &= 2(3.14)(1\text{cm}) + 2(3.14)(1\text{cm})(4\text{cm}) \\ &= \boxed{6.28\text{ cm}^2} + 25.12\text{ cm}^2 \\ &= 31.4\text{ cm}^2 \end{aligned}$$

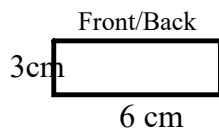
● Overlap

$$\begin{aligned} \text{Total SA} &= \text{Cylinder} + \text{Cube} - \text{Overlap} \\ &= 31.4\text{ cm}^2 + 96\text{ cm}^2 - 6.28\text{ cm}^2 \\ &= 121.12\text{ cm}^2 \\ &= 121\text{ cm}^2 \end{aligned}$$

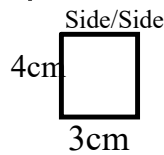
<sup>3</sup> b) cylinder on a rectangular prism



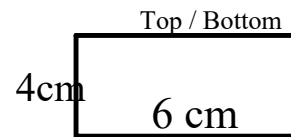
Rectangular Prism (3,4,6)



$$\begin{aligned} A &= 3\text{cm} \times 6\text{cm} \\ &= 18\text{cm}^2 \\ 2A &= 36 \end{aligned}$$



$$\begin{aligned} A &= 3\text{cm} \times 4\text{cm} \\ &= 12\text{cm}^2 \\ 2A &= 24 \end{aligned}$$



$$\begin{aligned} A &= 4\text{cm} \times 6\text{cm} \\ &= 24\text{cm}^2 \\ 2A &= 48 \end{aligned}$$

$$\begin{aligned} \text{Rectangular Prism SA} &= 2(18\text{cm}^2) + 2(12\text{cm}^2) + 2(24\text{cm}^2) \\ &= 36\text{cm}^2 + 24\text{cm}^2 + 48\text{cm}^2 \\ &= 108\text{cm}^2 \end{aligned}$$

$$\text{Area of cylinder} = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14)(0.5\text{cm})^2 + 2(3.14)(0.5\text{cm})(3\text{cm})$$

$$= 2(3.14)(0.25\text{cm}) + 2(3.14)(0.5\text{cm})(3\text{cm})$$

$$= \boxed{1.57\text{cm}^2} + 9.42\text{cm}^2$$

$$= 10.99\text{cm}^2$$

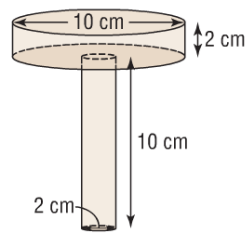
● overlap

$$\begin{aligned} \text{Total SA} &= \text{Cylinder} + \text{Rect Prism} - \text{Overlap} \\ &= 10.99\text{cm}^2 + 108\text{cm}^2 - 1.57\text{cm}^2 \\ &= 117.42\text{cm}^2 \\ &= 117\text{cm}^2 \end{aligned}$$

## Homework solutions

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3c c) cylinder on a cylinder



**puck shape** radius = 5 height = 2

$$\text{Area of 2nd cylinder} = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14)(5\text{cm})^2 + 2(3.14)(5\text{cm})(2\text{cm})$$

$$= 2(3.14)(25\text{cm}) + 2(3.14)(5\text{cm})(2\text{cm})$$

$$= 157 \text{ cm}^2 + 62.8 \text{ cm}^2$$

$$= 219.8 \text{ cm}^2$$

**long tube** radius = 1 height = 2

$$\text{Area of cylinder} = 2\pi r^2 + 2\pi rh$$

$$= 2(3.14)(1\text{cm})^2 + 2(3.14)(1\text{cm})(10\text{cm})$$

$$= 2(3.14)(1\text{cm}) + 2(3.14)(1\text{cm})(10\text{cm})$$

$$= \boxed{6.28 \text{ cm}^2} + 62.8 \text{ cm}^2$$

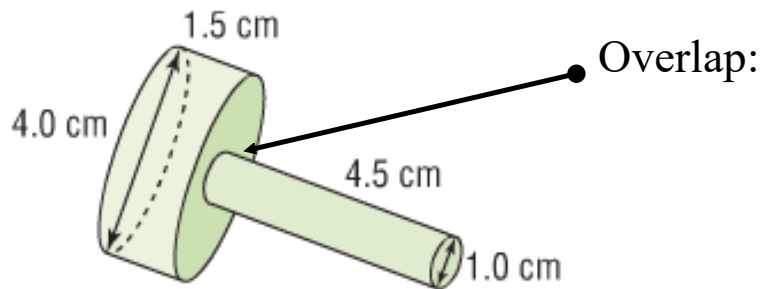
$$= 69.08 \text{ cm}^2$$

Overlap

$$\begin{aligned} \text{Total SA} &= \text{Cylinder} + \text{Cylinder} - \text{Overlap} \\ &= 69.08 \text{ cm}^2 + 219.8 \text{ cm}^2 - 6.28 \text{ cm}^2 \\ &= 282.6 \text{ cm}^2 \\ &= 283 \text{ cm}^2 \end{aligned}$$

4

a)



Top cylinder radius = 2 height = 1.5

$$\begin{aligned}
 \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\
 &= 2(3.14)(2\text{cm})^2 + 2(3.14)(2\text{cm})(1.5\text{cm}) \\
 &= 2(3.14)(4\text{cm}) + 2(3.14)(2\text{cm})(1.5\text{cm}) \\
 &= 25.12 \text{ cm}^2 + 18.84 \text{ cm}^2 \\
 &= 43.96 \text{ cm}^2
 \end{aligned}$$

Long cylinder

radius = 0.5 height = 4.5

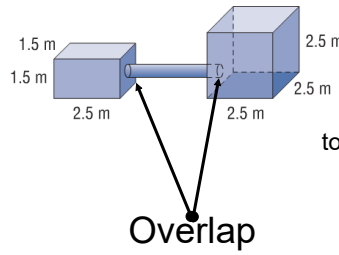
$$\begin{aligned}
 \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\
 &= 2(3.14)(0.5\text{cm})^2 + 2(3.14)(0.5\text{cm})(4.5\text{cm}) \\
 &= 2(3.14)(0.25\text{cm}) + 2(3.14)(0.5\text{cm})(4.5\text{cm}) \\
 &= 1.57 \text{ cm}^2 + 14.13 \text{ cm}^2 \\
 &= 15.7 \text{ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Total SA} &= \text{Cylinder} + \text{Cylinder} - \text{Overlap} \\
 &= 43.96 \text{ cm}^2 + 15.7 \text{ cm}^2 - 1.57 \text{ cm}^2 \\
 &= 58.09 \text{ cm}^2 \\
 &= 58.1 \text{ cm}^2
 \end{aligned}$$

Homework solutions

Solutions

- 4 b) The cylinder is 3.5 m long with diameter 0.5 m.

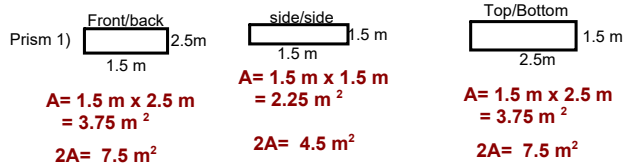


$$\begin{aligned} \text{total overlap} &= \text{overlap 1} + \text{overlap 2} \\ &= 0.3925 \text{ m}^2 + 0.3925 \text{ m}^2 \\ &= 0.785 \text{ m}^2 \end{aligned}$$

radius = 0.25 height = 3.5

$$\begin{aligned} \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)(0.25\text{m})^2 + 2(3.14)(0.25\text{m})(3.5\text{m}) \\ &= 2(3.14)(0.0625\text{m}^2) + 2(3.14)(0.25\text{cm})(3.5\text{m}) \\ &= 0.3925 \text{ m}^2 + 5.495 \text{ m}^2 \\ &= 5.8875 \text{ m}^2 \end{aligned}$$

Rectangular Prism (1.5, 1.5, 2.5)



$$\begin{aligned} A &= 1.5 \text{ m} \times 2.5 \text{ m} \\ &= 3.75 \text{ m}^2 \\ 2A &= 7.5 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} A &= 1.5 \text{ m} \times 1.5 \text{ m} \\ &= 2.25 \text{ m}^2 \\ 2A &= 4.5 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} A &= 1.5 \text{ m} \times 2.5 \text{ m} \\ &= 3.75 \text{ m}^2 \\ 2A &= 7.5 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{SA Prism 1} &= 7.5 \text{ m}^2 + 4.5 \text{ m}^2 + 7.5 \text{ m}^2 \\ &= 19.5 \text{ m}^2 \end{aligned}$$

Cube

$$\begin{aligned} \text{SA} &= 6(bxh) \\ &= 6(2.5 \text{ m} \times 2.5\text{m}) \\ &= (6) \times 6.25 \text{ m}^2 \\ &= 37.5 \text{ m}^2 \end{aligned}$$

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$$\begin{aligned} \text{Total SA} &= \text{Rectangular Prism} + \text{Cube} + \text{Cylinder} - \text{Total Overlap} \\ &= 19.5 \text{ m}^2 + 37.5 \text{ m}^2 + 5.8875 \text{ m}^2 - 0.785 \text{ m}^2 \\ &= 61.6025 \text{ m}^2 \end{aligned}$$

Or if you rounded to the nearest tenth

$$\begin{aligned} \text{Total SA} &= \text{Rectangular Prism} + \text{Cube} + \text{Cylinder} - \text{Total Overlap} \\ &= 19.5 \text{ m}^2 + 37.5 \text{ m}^2 + 5.8875 \text{ m}^2 - 0.785 \text{ m}^2 \\ &= 19.5 \text{ m}^2 + 37.5 \text{ m}^2 + 5.9 \text{ m}^2 - 0.8 \text{ m}^2 \\ &= 62.1 \text{ m}^2 \end{aligned}$$