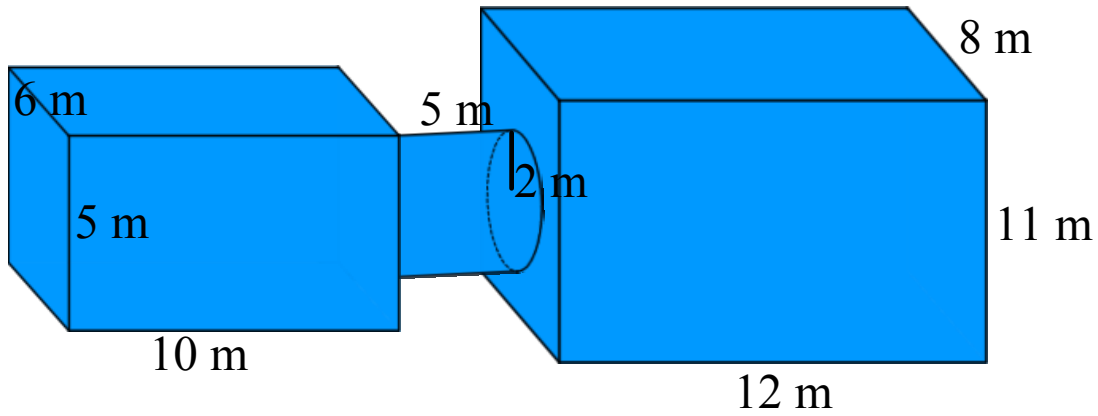


Warm Up

Find the surface area of the object



answer: 949.68m²

Solutions

Find the surface area of the object *** IMPORTANT

Prism (6,5,10)

Top A = 6 m x 10 m = 60 m ² 2A = 120	Side A = 6 m x 5 m = 30 m ² 2A = 60	Front A = 5 m x 10 m = 50 cm ² 2A = 100	
--	---	---	--

Total SA Large = 2Top + 2Side + 2Front
= 2(60 m²) + 2(30 m²) + 2(50 m²)
= 120 m² + 60 m² + 100 m²
= 280 m²

Prism (12, 11, 8)

Top A = 8 m x 12 m = 96 m ² 2A = 192	Side A = 8 m x 11 m = 88 m ² 2A = 176	Front A = 12 m x 11 m = 132 cm ² 2A = 264	
--	---	---	--

Total SA Large = 2Top + 2Side + 2Front
= 2(96 m²) + 2(88 m²) + 2(132 m²)
= 192 m² + 176 m² + 264 m²
= 632 m²

Cylinder

Area of Cylinder = $\pi r^2 + 2\pi rh$

$$= 2(3.14) (2)^2 + 2(3.14) (2) (5)$$

$$= 2(3.14) (4) + 2(3.14) (2) (5)$$

$$= 25.12 + 62.8$$

$$= 87.92 \text{ m}^2$$

Overlap (to CIRCLE with r = 2)

Area of overlap circle = πr^2

$$= (3.14) (2 \text{ m})^2$$

$$= 3.14 (4)$$

$$= 12.56 \text{ m}^2$$

x 4 faces

total overlap = 4(12.56 m²)
= 50.24 m²

Total Surface Area = cylinder + Prism + Prism - Total Overlap

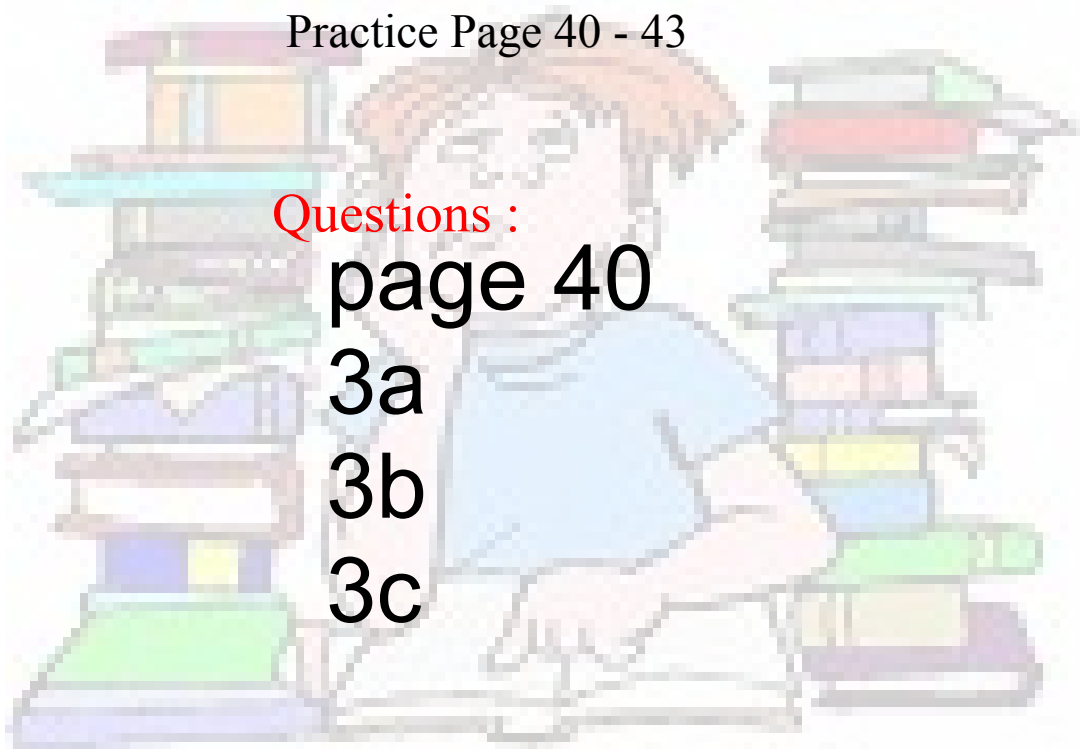
$$= 87.92 + 280 + 632 - 50.24 \text{ m}^2$$

$$= 999.92 - 50.24$$

$$= 949.68$$

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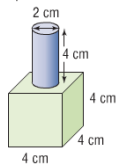


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3 a) cylinder on a cube



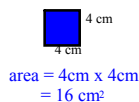
Overlap:

$$\begin{aligned}
 \text{Area of circle} &= \pi r^2 \\
 &= (3.14) (1 \text{ cm})^2 \\
 &= (3.14) 1 \text{ cm}^2 \\
 &= 3.14 \text{ cm}^2 \\
 &\quad \times 2 \quad \text{since 2 faces} \\
 &\quad \text{involved} \\
 &= \mathbf{6.28 \text{ cm}^2}
 \end{aligned}$$

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

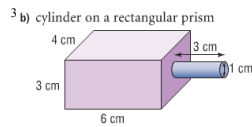


Cube



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

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

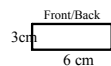


Overlap:

$$\begin{aligned} \text{Area of circle} &= \pi r^2 \\ &= (3.14) (0.5 \text{ cm})^2 \\ &= (3.14) 0.25 \text{ cm}^2 \\ &= 0.785 \text{ cm}^2 \\ &\quad \times 2 \text{ since 2 faces} \\ &\quad \text{involved} \\ &= 1.57 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)(0.5 \text{ cm})^2 + 2(3.14)(0.5 \text{ cm})(3 \text{ cm}) \\ &= 2(3.14)(0.25 \text{ cm}^2) + 2(3.14)(0.5 \text{ cm})(3 \text{ cm}) \\ &= 1.57 \text{ cm}^2 + 9.42 \text{ cm}^2 \\ &= 10.99 \text{ cm}^2 \end{aligned}$$

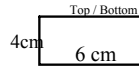
Rectangular Prism



$$A = 3 \text{ cm} \times 6 \text{ cm} = 18 \text{ cm}^2$$



$$A = 3 \text{ cm} \times 4 \text{ cm} = 12 \text{ cm}^2$$



$$A = 4 \text{ cm} \times 6 \text{ cm} = 24 \text{ cm}^2$$

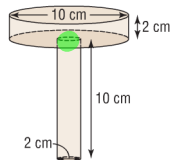
$$\begin{aligned} \text{Rectangular Prism SA} &= 2(18 \text{ cm}^2) + 2(12 \text{ cm}^2) + 2(24 \text{ cm}^2) \\ &= 36 \text{ cm}^2 + 24 \text{ cm}^2 + 48 \text{ cm}^2 \\ &= 108 \text{ cm}^2 \end{aligned}$$

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

Homework solutions

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3c c) cylinder on a cylinder



Overlap:

$$\begin{aligned} \text{Area of circle} &= \pi r^2 \\ &= (3.14) (1 \text{ cm})^2 \\ &= (3.14) 1 \text{ cm}^2 \\ &= 3.14 \text{ cm}^2 \\ &\quad \times 2 \text{ since 2 faces} \\ &\quad \text{involved} \\ &= 6.28 \text{ cm}^2 \end{aligned}$$

long tube

$$\begin{aligned} \text{Area of cylinder} &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)(1 \text{ cm})^2 + 2(3.14)(1 \text{ cm})(10 \text{ cm}) \\ &= 2(3.14)(1 \text{ cm}^2) + 2(3.14)(1 \text{ cm})(10 \text{ cm}) \\ &= 6.28 \text{ cm}^2 + 62.8 \text{ cm}^2 \\ &= 69.08 \text{ cm}^2 \end{aligned}$$

puck shape

$$\begin{aligned} \text{Area of 2nd cylinder} &= 2\pi r^2 + 2\pi rh \\ &= 2(3.14)(5 \text{ cm})^2 + 2(3.14)(5 \text{ cm})(2 \text{ cm}) \\ &= 2(3.14)(25 \text{ cm}^2) + 2(3.14)(5 \text{ cm})(2 \text{ cm}) \\ &= 157 \text{ cm}^2 + 62.8 \text{ cm}^2 \\ &= 219.8 \text{ cm}^2 \end{aligned}$$

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

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4a

4b

