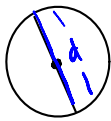


5.4 Surface Area of a Cylinder

Review circumference of a circle:



$$\pi = \frac{C}{d}$$

$$C = \pi d$$

$$C = 2\pi r$$

Find the circumference of a bicycle tire with radius 30 cm.

$$C = 2\pi(30) \quad \text{or} \quad C = \pi(60)$$



$$C = 188.4 \text{ cm}$$

$$100\,000 \text{ cm} = 1 \text{ km}$$

How many times will the tire need to rotate if travelling for 3 km?

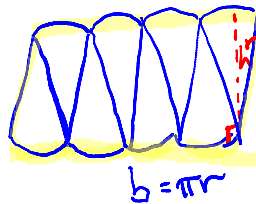
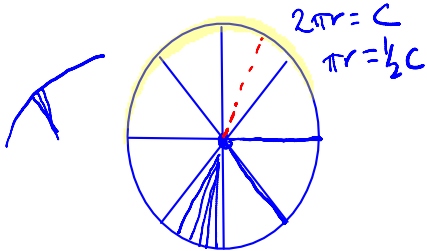
$$188.4 \text{ cm} \times n = 3 \text{ km}$$

$$188.4 \text{ cm} \times n = 300\,000 \text{ cm}$$

$$n = 1592.3$$

Review area of a circle:

$$A = \pi r^2$$



$$A = \pi r \times h$$

$$= \pi r^2$$

Find the area of a circle with diameter 17 m.

$$A = \pi r^2$$

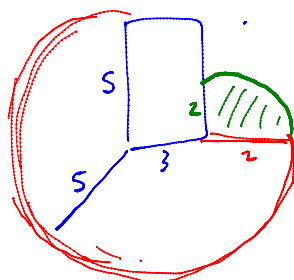
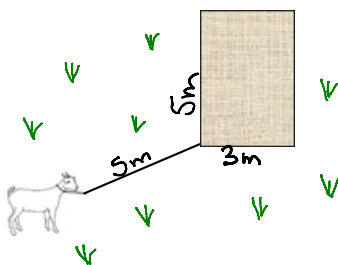
$$= \pi (8.5)^2$$

$$= \pi (72.25)$$

$$= 226.9 \text{ m}^2$$



Find the area of grass the goat can access



$$A = \frac{3}{4}\pi(5)^2$$

$$= 25 \times \frac{3}{4} \times \pi$$

$$= \frac{75\pi}{4}$$

$$A = \frac{1}{4}\pi(2)^2$$

$$= 4 \times \frac{1}{4} \times \pi$$

$$= \pi$$

Total.

$$\frac{75\pi}{4} + \frac{4\pi}{4}$$

$$\frac{79\pi}{4} \text{ m}^2$$

Find the radius of a circle with an area of 232.2 m^2 .

Find the radius of a circle with an area of 232.2 m^2 .

$$\frac{232.2}{\pi} = \frac{\pi r^2}{\pi}$$

$$73.95 = r^2$$

$$\sqrt{73.95} = r$$

$$8.6 = r$$

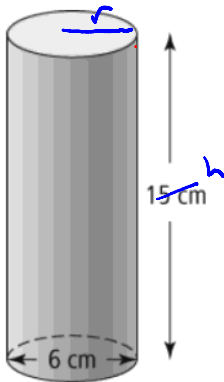
8.6 m

$$r^2 = 9$$

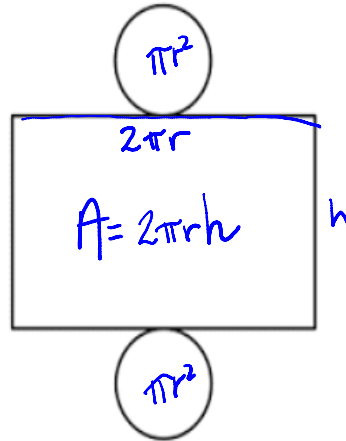
$$r = \sqrt{9}$$

$$r = 3$$

Surface area of a cylinder.



Draw the net and label all the dimensions to calculate the surface area.



$$SA = 2\pi r^2 + 2\pi rh$$

Surface area visual

Ex: Find the surface area of a cylinder with height 10 cm and diameter 10 cm.

$$= 2\pi(5)^2 + 2\pi(5)(10)$$

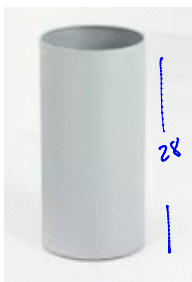
$$= 50\pi + 100\pi$$

$$= 150\pi$$

$$150\pi \text{ cm}^2$$

$$\approx 471 \text{ cm}^2$$

Ex: Calculate the surface area of a cylindrical waste basket without a lid that measures 28 cm high and 18 cm in diameter. Give your answer to the nearest square centimetre.



$$SA = \cancel{2}\pi r^2 + 2\pi rh$$

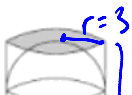
$$= \pi(9)^2 + 2\pi(9)(28)$$

$$= 81\pi + 504\pi$$

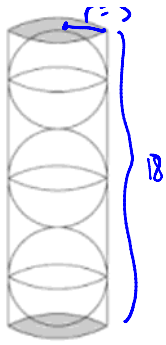
$$= 585\pi$$

$$= 1836.9 \text{ cm}^2$$

Ex: Calculate the amount of material needed to make a can that holds three tennis balls. Each tennis ball has a diameter of 6 cm.



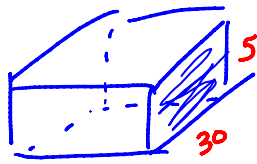
$$= 2\pi(3)^2 + 2\pi(3)(18)$$



$$\begin{aligned}
 &= 2\pi(3)^2 + 2\pi(3)(18) \\
 &= 18\pi + 108\pi \\
 &= 126\pi \\
 &= 395.64 \text{ cm}^2
 \end{aligned}$$

Assignment p186 4b,5a,6b,8 > 13

p180 #13



Sides

$$\begin{aligned}
 &4(5 \times 30) + (30 \times 30) \\
 &600 + 900
 \end{aligned}$$

1500 cm² per pan.

$$\frac{400000 \text{ cm}^2}{1500 \text{ cm}^2} = 266.666\dots$$

So 266 pans