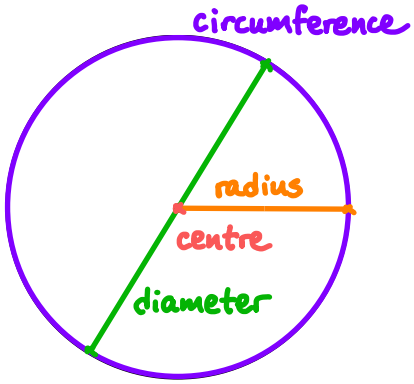
5.4 – SURFACE AREA OF A CYLINDER

Review: Circles

1. Draw and label the following on the circle:



- Centre/center - c or p
- Radius - r
- Diameter - d
- Circumference - C

2. If the radius of the above circle is 5 cm, calculate its:

a. Circumference $C = \pi \times d = 2 \times \pi \times r$ (since $d = 2 \times r$)

$C = 2 \times \pi \times (5)$

$= 10\pi$

$\doteq 31.42 \text{ cm}$

b. Area $A = \pi r^2$

$A = \pi (5)^2$

$= 25\pi$

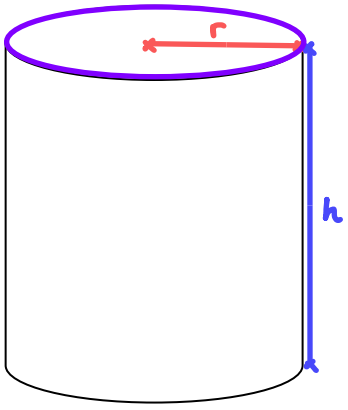
$\doteq 78.54 \text{ cm}^2$

Calculating the Surface Area of a Cylinder

Step 1: area of the two circles

$A = \pi r^2 + \pi r^2 = 2\pi r^2$

(top, bottom)



Step 2: area of the side (rectangle)

$A = l \times w = 2\pi r \times h = 2\pi rh$

($2\pi r$: circumference; h: height)

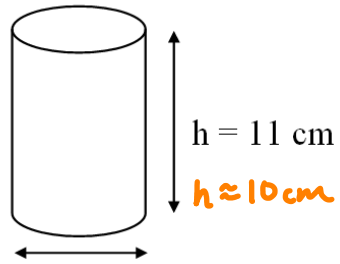
Step 3: total:

$S.A. = 2\pi r^2 + 2\pi rh = 2\pi r(r + h)$

Mathematics 8 – 5.4

Example 1:

a. Estimate the surface area of the cylinder.



h = 11 cm

h ≈ 10 cm

d = 6.2 cm

r = 3.1 cm

d ≈ 6 cm

r ≈ 3 cm

$S.A. = 2\pi r^2 + 2\pi rh$

$= 2\pi(3)^2 + 2\pi(3)(10)$

$= 18\pi + 60\pi$

$= 78\pi \approx 245\ cm^2$

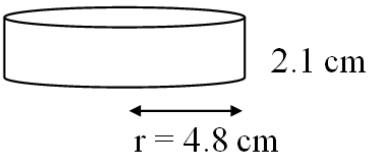
b. Calculate the surface area of the cylinder. Express your answer to the nearest hundredth of a square centimetre.

$S.A. = 2\pi(3.1)^2 + 2\pi(3.1)(11)$

$\doteq 274.64\ cm^2$

Example 2:

Estimate and then calculate the total surface area of the cylinder to the nearest tenth of a square cm.



2.1 cm

r = 4.8 cm

$S.A. = 2\pi r^2 + 2\pi rh$

$= 2\pi(4.8)^2 + 2\pi(4.8)(2.1)$

$\doteq 208.10\ cm^2$

Assignment: p. 186 #4, 5, 8 – 11