

Measurement

Lesson #1:

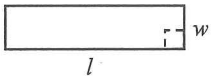
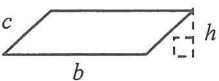
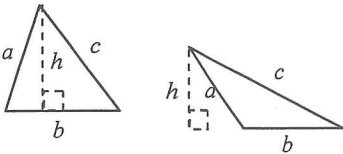
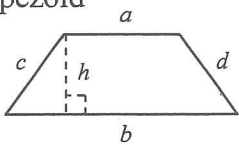
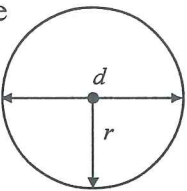
Perimeter and Area

The perimeter is defined as the distance around an object. It can be found by adding up the measurements of all the edges of an object.

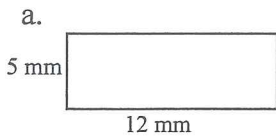
When finding the perimeter, it is easiest to cross off each side as you add it so you don't miss a side.

Alternately, the formulae below can be used to find the perimeter of an object.

Area is defined as being the space in between the edges of a two dimensional object. To find the area of objects, one of several formulae need to be used. The following lists the formula for each figure:

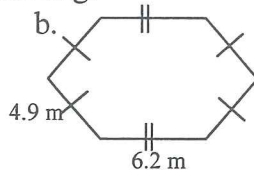
Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ $P = 2(l + w)$	$A = lw$
Parallelogram 	$P = b + b + c + c$ $P = 2b + 2c$	$A = bh$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$
Trapezoid 	$P = a + b + c + d$	$A = \frac{1}{2}(a + b)h$ $A = \frac{(a + b)h}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Ex 1: Find the perimeter of the following:



$$P = 12 + 5 + 12 + 5$$

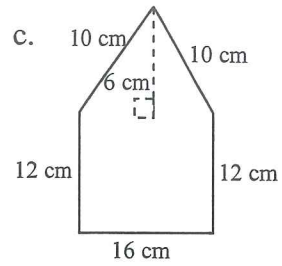
$$= 34 \text{ mm}$$



$$P = 2(6.2) + 4(4.9)$$

$$= 12.4 + 19.6$$

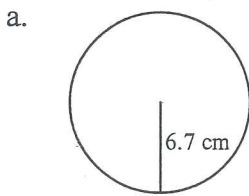
$$= 32 \text{ m}$$



$$P = 16 + 12 + 12 + 10 + 10$$

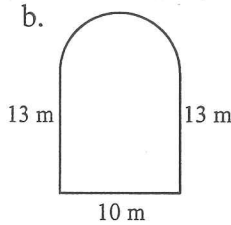
$$= 60 \text{ cm}$$

Ex 2: Find the perimeter of the following. (Write the formula down)



$$C = 2\pi r$$

$$= 42.1 \text{ cm}$$



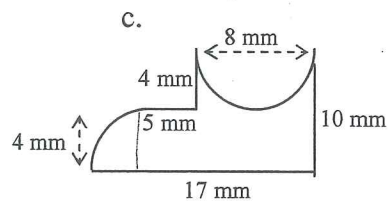
$$C = \frac{1}{2}C$$

$$= \pi r$$

$$= 15.7$$

$$P = 15.7 + 13 + 13 + 10$$

$$= 51.7 \text{ m}$$



$$C = \frac{1}{4}C$$

$$= \frac{1}{2}\pi r$$

$$= 6.3$$

$$U = \frac{1}{2}C$$

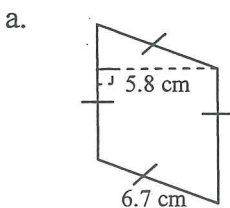
$$= \pi r$$

$$= 12.6$$

$$P = 6.3 + 5 + 4 + 12.6 + 10 + 17$$

$$= 54.9 \text{ mm}$$

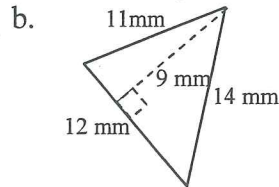
Ex 3: Find the area of the following:



$$A = bh$$

$$= 5.8 \times 6.7$$

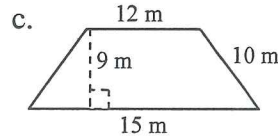
$$= 38.86 \text{ cm}^2$$



$$A = \frac{bh}{2}$$

$$= \frac{12 \times 9}{2}$$

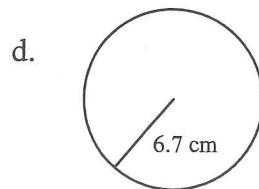
$$= 54 \text{ mm}^2$$



$$A = \frac{(a+b)h}{2}$$

$$= \frac{(12+15)9}{2}$$

$$= 121.5 \text{ m}^2$$



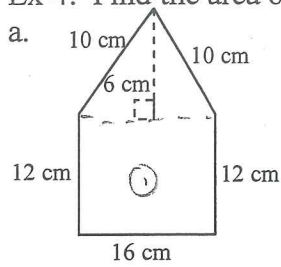
$$A = \pi r^2$$

$$= \pi (6.7)^2$$

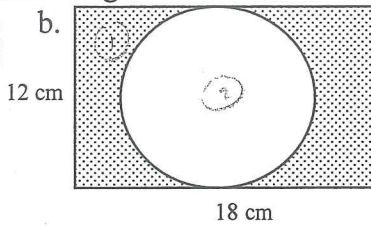
$$= 141.0 \text{ cm}^2$$

Now, let's try some composite figures. For these, split the figure into 2 or more of the basic figures above, and find the area of each figure.

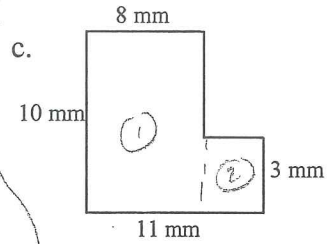
Ex 4: Find the area of the following:



Area ① = $bh = 16(12) = 192$
 Area ② = $\frac{bh}{2} = \frac{16(6)}{2} = 48$
 Area = 240 cm^2



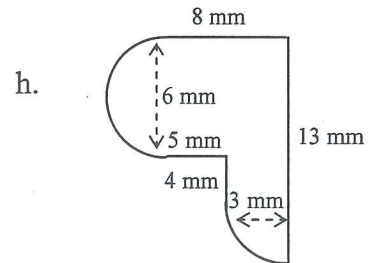
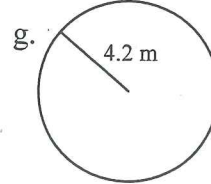
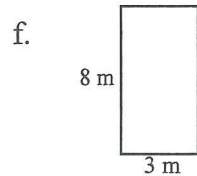
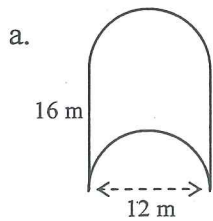
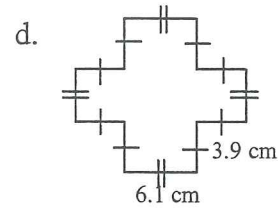
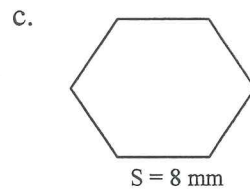
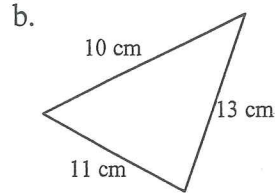
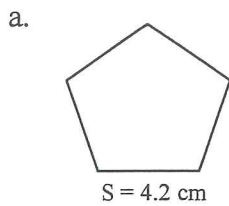
Area ① = $bh = 18(12) = 216$
 Area ② = $\pi r^2 = \pi(6)^2 = 113.1$
 Area = $216 - 113.1 = 102.9 \text{ cm}^2$



Area ① = $bh = 10(8) = 80$
 Area ② = $bh = 3(3) = 9$
 Area = 9 mm^2

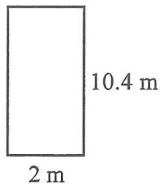
Assignment:

1. Find the perimeter of the following:

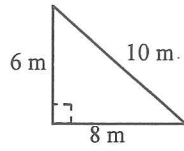


2. Find the area of the following:

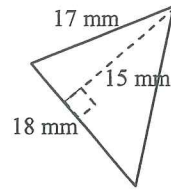
a.



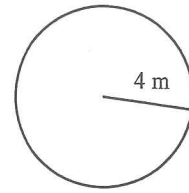
b.



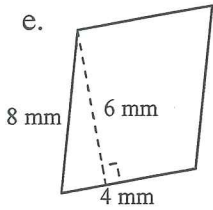
c.



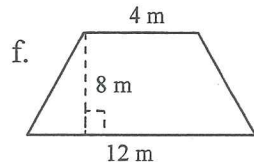
d.



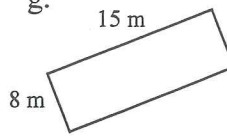
e.



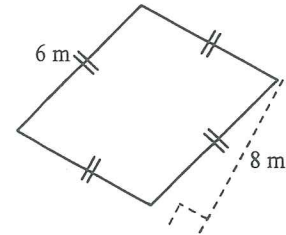
f.



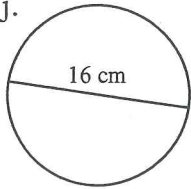
g.



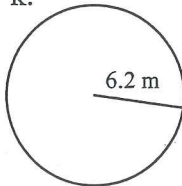
h.



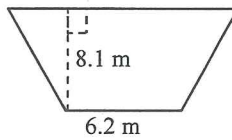
j.



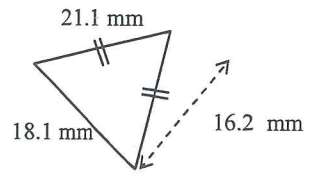
k.



L. 10.3 m

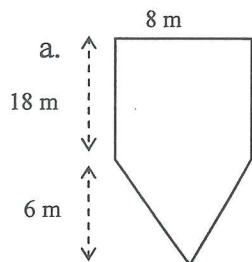


M.

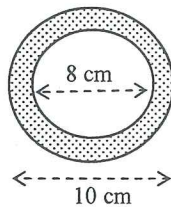


3. Find the area:

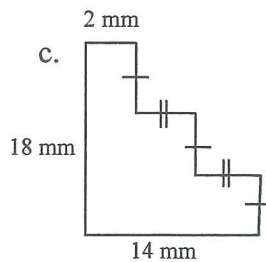
a.



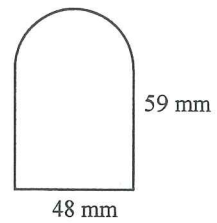
b.



c.



d.



4. Solve the following (draw a picture)

- a. A man paints a rectangular wall with a circular hole of radius 56 cm. If the dimensions of the wall are 180 cm x 320 cm, find the painted area.
- b. A square lawn has a fence that is 80 m around the whole lawn. Find the area of the lawn.
- c. The cross section of a circular concrete pipe has an inner diameter of 15 cm, and an outer diameter of 28 cm. Find the area of the concrete of the cross section
- d. A dart board is five concentric rings which are each 10 cm thick. If the bull's eye has a radius of 10 cm, find the area of each ring, and the bull's eye.

Answer Key:

- | | | | |
|--|-----------|----------|------------|
| 1a) 21 | 1b) 34 | 1c) 48 | 1d) 55.6 |
| 1e) 69.7 | 1f) 22 | 1g) 26.4 | 1h) 44.1 |
| 2a) 20.8 | 2b) 24 | 2c) 135 | 2d) 50.3 |
| 2e) 24 | 2f) 64 | 2g) 120 | 2h) 48 |
| 2i) 201.1 | 2k) 120.8 | 2l) 66.8 | 2m) 146.6 |
| 3a) 168 | 3b) 28.3 | 3c) 144 | 3d) 3736.8 |
| 4a) 47748 | 4b) 400 | 4c) 439 | |
| 4d) be: 314.1, 942, 1570, 2198, 2826, 3454 | | | |

