

Name Mrs. Jand.

Math 9

(MTH1W)



Unit 4:

Measurement

of 2-D (Plane) Shapes
and 3-D (Solid) Shapes

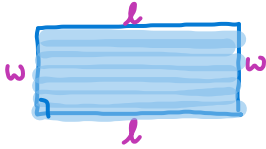
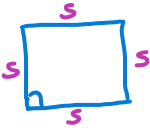
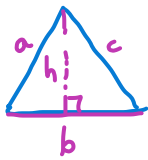
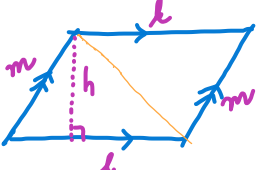
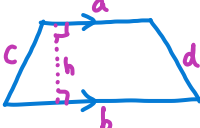
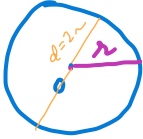
Math 9 – Unit 4: Measurement

Name: _____

Lesson #4.1: Perimeter and Area of 2D Figures

Date: _____

Learning Goal: We are learning to calculate the perimeter, circumference, and area for common 2D simple and compound shapes.

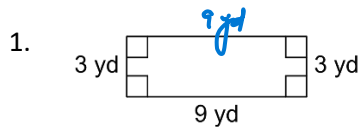
RECTANGLE  $P = 2l + 2w$ $A = lw$	SQUARE  $P = 4s$ $A = s \cdot s = s^2$	TRIANGLE   $P = a + b + c$ $A = \frac{b \cdot h}{2}$
PARALLELOGRAM  $P = 2l + 2m$ $A = bh$	TRAPEZOID   $P = a + c + b + d$ $A = \frac{(a+b)h}{2}$	CIRCLE  $\pi = 3.14$ (approx). $P = C = 2\pi r$ $= (2r)\pi$ $= d\pi$ $A = \pi r^2$ $= \pi \cdot r \cdot r$

* **UNITS** very important

Perimeter $\rightarrow$ units eg cm, m, km, . .

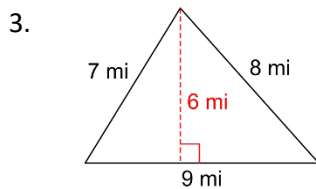
Area $\rightarrow$ square units eg cm^2 , m^2 , km^2 . . .
(sq.cm) (sq.m)

Find the perimeter (if possible) and area of each shape.



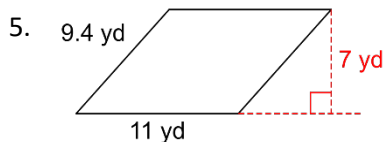
$$P = 2(l + w) = 2(9 + 3) = 24 \text{ yd}$$

$$A = lw = (9 \text{ yd})(3 \text{ yd}) = 27 \text{ yd}^2 \text{ or } 27 \text{ sq. yd.}$$



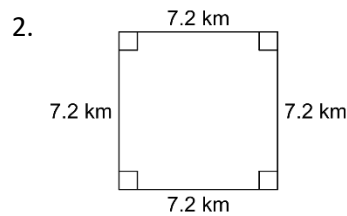
$$P = a + b + c = 7 + 8 + 9 = 24 \text{ mi}$$

$$A = \frac{bh}{2} = \frac{(9)(6)}{2} = 27 \text{ mi}^2$$



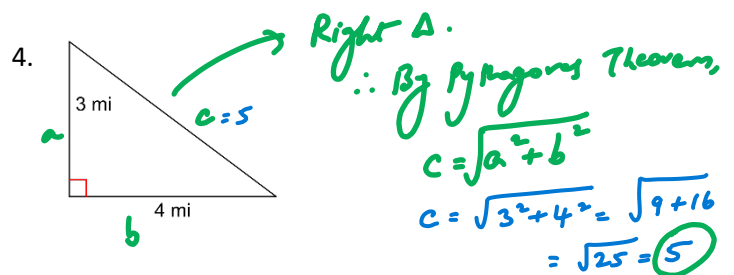
$$P = 2(9.4 + 11) = 40.8 \text{ yd.}$$

$$A = bh = (11 \text{ yd})(7 \text{ yd}) = 77 \text{ yd}^2$$



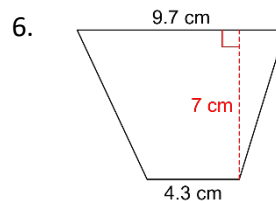
$$P = 4 \text{ side} = 4(7.2) = 28.8 \text{ km}$$

$$A = (\text{side})(\text{side}) = (7.2 \text{ km})(7.2 \text{ km}) = 51.84 \text{ km}^2$$



$$\therefore P = 3 + 4 + 5 = 12 \text{ mi}$$

$$A = \frac{bh}{2} = \frac{(4)(3)}{2} = 6 \text{ mi}^2$$



$P \rightarrow$ Not sufficient info to find P .

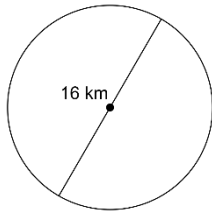
$$A = \frac{(b_1 + b_2)h}{2}$$

$$= \frac{(9.7 + 4.3)7}{2}$$

$$= \frac{(14)(7)}{2} = 49 \text{ cm}^2$$

Find the circumference and the area of each circle.

7.



$$d = 16 \text{ km}$$

$$\therefore r = \frac{16}{2} = 8 \text{ km.}$$

$$C = 2\pi r$$

$$= 2(3.14)(8)$$

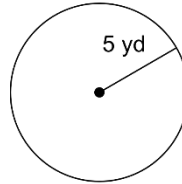
$$= 50.24 \text{ km.}$$

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

$$= 3.14(8)(8)$$

$$= 200.96 \text{ km}^2$$

8.



$$C = 2\pi r$$

$$= 2(3.14)(5)$$

$$= 31.4 \text{ yd}$$

$$A = 3.14(5)(5)$$

$$= 78.5 \text{ yd}^2$$

Use the appropriate formula to find the missing piece.

9. A triangle has a height of 22cm and an area of 143cm^2 . What is the length of the base?

Given: $h = 22\text{cm}$; $A = 143\text{cm}^2$

To find: $b = ?$

$$A = \frac{bh}{2} \Rightarrow \frac{2A}{h} = b$$

$$\therefore b = \frac{2A}{h} = \frac{2(143)}{22} = 13\text{cm}$$

Ans Length of base of $\Delta = 13\text{cm}$.

10. A large pizza has an area of 201in^2 . What is the diameter, in inches, of the pizza.

Given

$$A = 201\text{in}^2$$

To find: $d = ?$ $d = 2r$ but $r = ?$

$$A = \pi r^2 \Rightarrow \frac{A}{\pi} = r^2$$

$$\Rightarrow \sqrt{\frac{A}{\pi}} = r$$

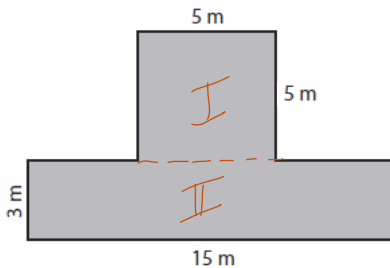
$$\therefore r = \sqrt{\frac{201}{3.14}} = \sqrt{64} = 8$$

(We only consider positive length)

Ans diameter of pizza $= 2(8)$
 $= 16\text{ inches.}$

Find the area of the compound figures.

11.



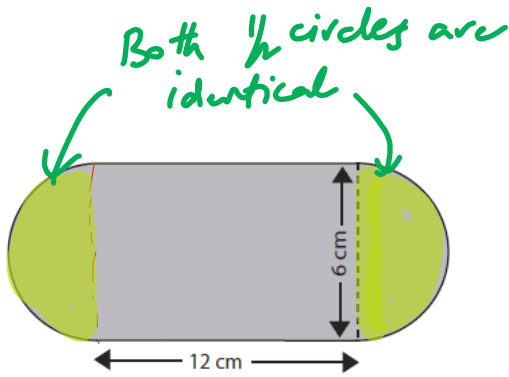
Area of figure = Area (Square^I) + Area (Rectangle^{II})

$$= (5)(5) + (15)(3)$$

$$= 25 + 45$$

$$= 70\text{ m}^2$$

12.



Area of figure

$$= \text{Area (rectangle)} + \text{Area (2 semi-circles)}$$

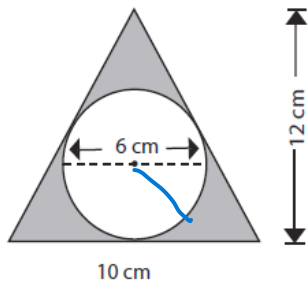
(i.e. 1 circle)

$$= (12)(6) + (3.14)(3)(3)$$

$$= 72 + 28.26$$

$$= 100.26 \text{ cm}^2$$

13.



$$d = 6 \text{ cm}$$

$$\therefore r = \frac{6}{2} = 3 \text{ cm.}$$

Area of shaded region

$$= \text{Area (Triangle)} - \text{Area (Circle)}$$

$$\frac{bh}{2}$$

$$- \pi r \cdot r$$

$$= \left[\frac{(10)(12)}{2} \right] - [(3.14)(3)(3)]$$

$$= 60 - 28.26$$

$$= 31.74 \text{ cm}^2$$

Success Criteria:

- I can find the perimeter and area of a square, rectangle, triangle, parallelogram, or trapezoid
- I can find the circumference and area of a circle
- I can find the area of compound shapes by breaking them down into simpler shapes
- I can, if given the area, find another missing dimension