MTH1W

Math 9 – Unit 4: Measurement

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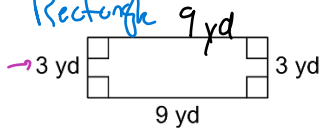
Lesson #4.1: Perimeter and Area of 2D Figures

Date: Jan 9, 2023

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

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

1. Rectangle



add all sides

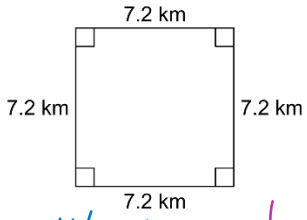
$w = 3$
$\ell = 9$

$P = 3 + 9 + 3 + 9$
$P = 24\text{ yd}$

$A = \ell w$
$A = (9)(3)$
$A = 27\text{ yd}^2$

$(x)(x) = x^2$

2. Square



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

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

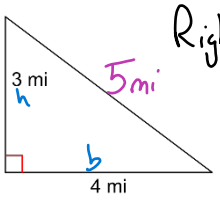
3. Triangles

b = base
h = height → connect

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

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

4.

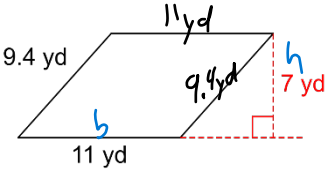


Right Triangle:
$a^2 + b^2 = c^2$
$3^2 + 4^2 = c^2$
$9 + 16 = c^2$
$\sqrt{25} = \sqrt{c^2}$
$5 = c$

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

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

5.

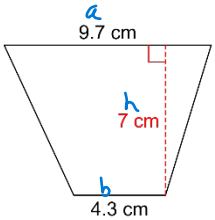


Parallelogram

$P = 9.4 + 11 + 9.4 + 11$
$P = 40.8\text{ yd}$

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

6.



Trapezoid

No perimeter.

$A = \frac{(a+b)h}{2}$
$A = \frac{(9.7+4.3)(7)}{2}$
$A = \frac{(14)(7)}{2}$
$A = 49\text{ cm}^2$

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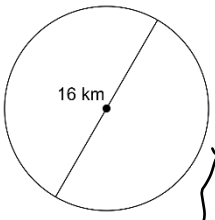
perimeter of a circle.

Find the circumference and the area of each circle.

7.



$d = 16$

$r = 8$

$A = \pi r^2$

$A = (3.14)(8)^2$

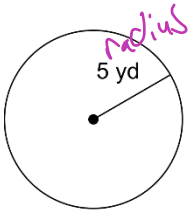
$A = 200.96 km^2$

~~$C = \pi d$~~

$C = 2\pi r$

$C = 2(3.14)(8) = 50.24 km$

8.



$C = 2\pi r$

$C = 2(3.14)(5)$

$C = 31.4 yd$

$A = \pi r^2$

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

$A = 78.5 yd^2$

Use the appropriate formula to find the missing piece.

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

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

$b = ?$

$143 = \frac{b(22)}{2}$

$\frac{143}{11} = \frac{b(11)}{11}$

$13 = b$

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

$A = \pi r^2$

$\frac{201}{3.14} = \frac{(3.14)r^2}{3.14}$

$\sqrt{64} = \sqrt{r^2}$

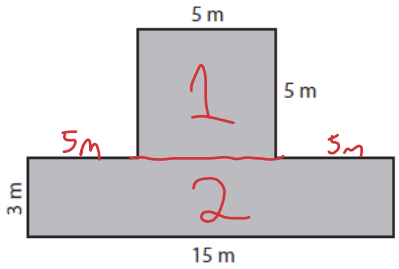
$8 = r$

∴ radius = 8 in

∴ the diameter of the large pizza is 16 in.

Find the area of the compound figures.

11.



$A_1 = lw$

$A_1 = (5)(5)$

$A_1 = 25m^2$

$A_2 = lw$

$A_2 = (15)(3)$

$A_2 = 45m^2$

$A = A_1 + A_2$

$A = 25 + 45$

$A = 70m^2$

Medium has diameter of 12 in.

$A = \pi r^2$

$A = (3.14)(6)^2$

$A = 113.04$

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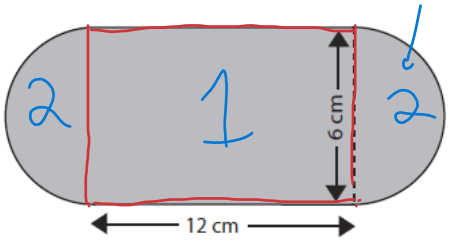
12.



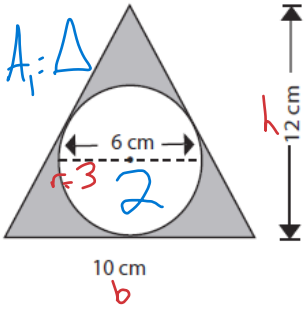
$d = 6$
$r = 3$

$A_1 = lw$
$A_1 = (12)(6)$
$A_1 = 72 cm^2$

$A_2 = \pi r^2$
$A_2 = (3.14)(3)^2$
$A_2 = 28.26 cm^2$

$A = 72 + 28.26 = 100.26 cm^2$

13. Find the area of the shaded region.



$A_1 = \frac{bh}{2}$
$A_1 = \frac{(10)(12)}{2}$
$A_1 = 60 cm^2$

$A_2 = \pi r^2$
$A_2 = (3.14)(3)^2$
$A_2 = 28.26$

$A = 60 - 28.26$
$A = 31.74 cm^2$

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