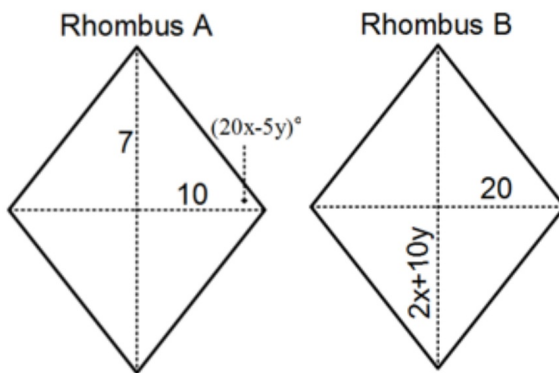


D Extension WS**SIMILARITY**

1) Rhombus A and Rhombus B are similar. Solve for x and y .



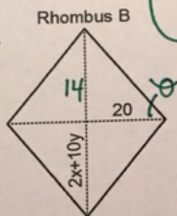
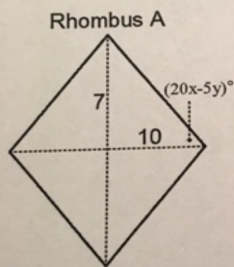
D

Extension WS Solutions

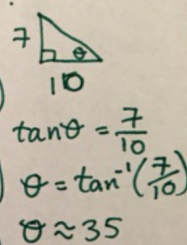
SIMILARITY

Extension Problems to Similar Objects

1) Rhombus A and Rhombus B are similar. Solve for x and y.

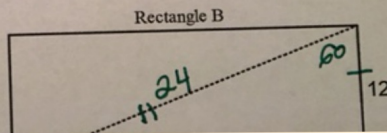
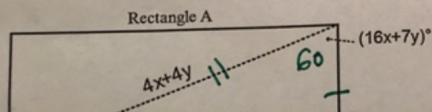


$$\begin{aligned} -10(2x+10y) &= 14 \\ 20x - 5y &= 35 \\ \rightarrow -20x - 100y &= -140 \\ \hline -105y &= -105 \\ \boxed{y} &= 1 \end{aligned}$$



$$\begin{aligned} 2x + 10(1) &= 14 \\ 2x &= 4 \\ \boxed{x} &= 2 \end{aligned}$$

2) Rectangle A and Rectangle B are congruent. Solve for x and y.

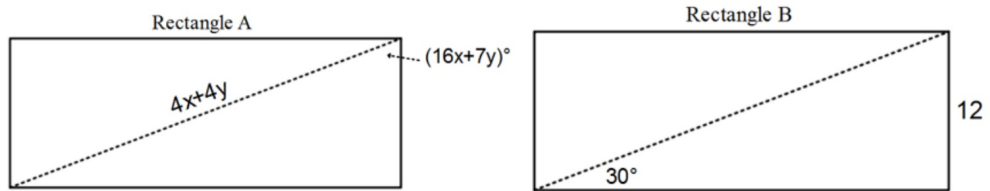


"EQUAL" congruent.

D Extension WS

SIMILARITY

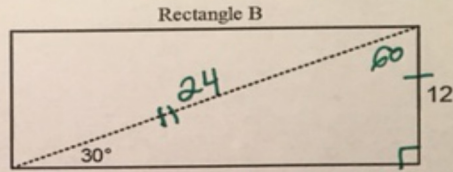
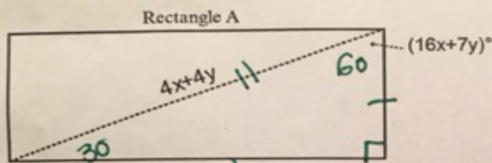
2) Rectangle A and Rectangle B are congruent. Solve for x and y .



D Extension WS Solutions

SIMILARITY

2) Rectangle A and Rectangle B are "EQUAL" congruent. $x = 2$ Solve for x and y.



$$\begin{aligned} -4(4x+4y=24) \\ 16x+7y=60 \end{aligned}$$

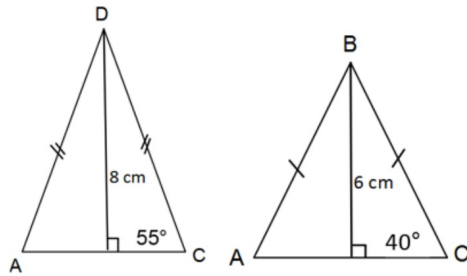
$$\begin{aligned} \rightarrow -16x-16y &= -96 \\ 16x+7y &= 60 \\ \hline -9y &= -36 \end{aligned}$$

$$y = 4$$

$$\begin{aligned} 4x+4(4) &= 24 \\ 4x &= 8 \\ x &= 2 \end{aligned}$$

D Extension WS**SIMILARITY**

3) Given the two isosceles triangles, compose quadrilateral $ABCD$ and find the perimeter. The figures are not drawn to scale. (Round answer to the nearest 0.01 cm^2).

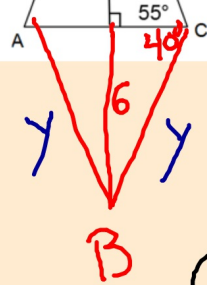
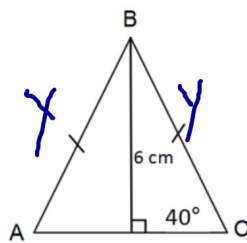
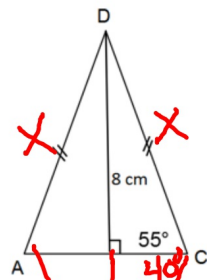


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Extension WS Solutions

SIMILARITY

3) Given the two isosceles triangles, compose quadrilateral ABCD and find the perimeter. The figures are not drawn to scale. (Round answer to the nearest 0.01 cm²).



$$\sin 40 = \frac{6}{y}$$

$$y = \frac{6}{\sin 40}$$

$$\sin 55 = \frac{8}{x}$$

$$x = \frac{8}{\sin 55}$$

$$P = 2\left(\frac{6}{\sin 40}\right) + 2\left(\frac{8}{\sin 55}\right)$$

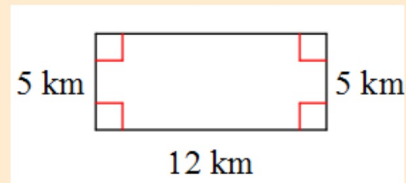
$$P \approx 38.20 \text{ cm}^2$$

D Extension WS

SIMILARITY

4) We call a figure **equiable** if its perimeter and area are equal.

a) Is this figure equiable?



b) Show that any closed 2-dimensional shape can be *dilated* (multiplied by some scale factor) to become equiable.

D**Extension WS Solutions****SIMILARITY**

$$\text{Area} = 5(12) = 60 \text{ km}^2$$
$$\text{Perimeter} = 2(5+12) = 2(17) = 34 \text{ km}$$

Area \neq Perimeter

4b) For rectangles:



$$\text{Perimeter: } 2(a+b)$$
$$\text{Area: } ab$$

$$\text{Perimeter: } 2(ka+kb) = 2k(a+b)$$
$$\text{Area: } ka(kb) = k^2 ab$$

Goal:
When are area and perimeter equal?
Let's find out:

D Extension WS Solutions

SIMILARITY

Let's find out:

$$\frac{k^2 ab}{k} = \frac{2k(a+b)}{k} \quad (\text{by definition of equiable})$$

$$\frac{kab}{ab} = \frac{2(a+b)}{ab}$$

$$k = \frac{2(a+b)}{ab}$$

$$k = \frac{\text{perimeter}}{\text{area}} \quad (\text{by definition of perimeter and area})$$

Therefore multiplying by a scalar of $\frac{\text{perimeter}}{\text{area}}$ will turn a non-equiabe rectangle into an equiabe rectangle.

*NOTE: This will work for any closed 2-dimensional figure, not just for rectangles.