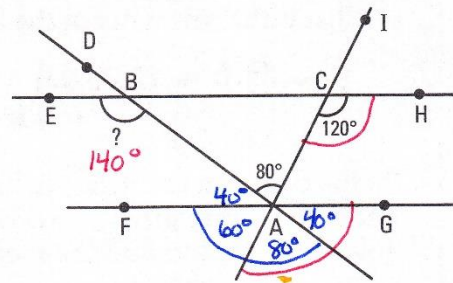


1. In the figure on the right, we have:  
 $BC \parallel FG$ ,  $m \angle BAC = 80^\circ$  and  $m \angle ACH = 120^\circ$ .  
 What is the measure of angle ABE?  $140^\circ$



2. In each of the following cases, indicate whether the given information is sufficient or not to prove that the triangles are congruent. If yes, indicate the theorem of congruency that applies.

a) Yes ASA

b) No

c) Yes SAS

d) Yes SSS

3. In each of the following cases, indicate whether the given information is sufficient or not to prove that the triangles are similar. If yes, indicate the similarity theorem that applies.

a)  $\frac{2.4}{1.2} = 2$   
 $\frac{3.2}{1.6} = 2$   
Yes SAS

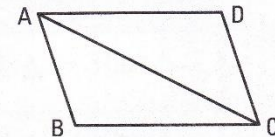
b) No

c) Yes SSS

d) Yes AA

4. In the parallelogram ABCD on the right, diagonal AC is drawn. Show that triangles ABC and CDA are congruent.

Hypothesis: ABCD is a parallelogram

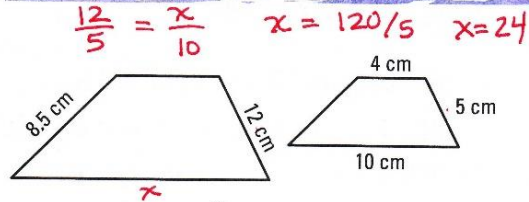


Statement	Justification
$\overline{AD} \cong \overline{BC}$	Opposite sides of a parallelogram are congruent
$\angle B \cong \angle D$	Opposite angles of a parallelogram are congruent
$\overline{AB} \cong \overline{DC}$	Opposite sides of a parallelogram are congruent
$\triangle ABC \cong \triangle CDA$	SAS

$$\frac{12}{5} = \frac{x}{4} \quad 5y = 48 \quad y = 9.6$$

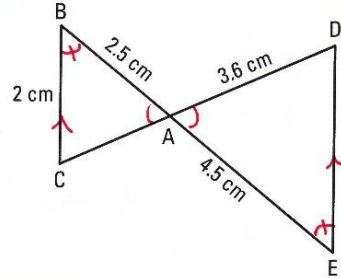
5. The two trapezoids on the right are similar. What is the perimeter of the large trapezoid?

$$P = 8.5 + 12 + 24 = 44.5 \text{ cm} \\ + 9.6 = 54.1$$



6. In the figure on the right, we have:  $\overline{BC} \parallel \overline{DE}$ ,  $m\overline{AB} = 2.5 \text{ cm}$ ,  $m\overline{AE} = 4.5 \text{ cm}$ ,  $m\overline{AD} = 3.6 \text{ cm}$ . Complete and justify the following steps to find the measure of  $\overline{AC}$ .

Consider triangles ABC and AED.



Statement	Justification
1. $\angle BAC \cong \angle DAE$	Vertically opposite angles are congruent
2. $\angle ABC \cong \angle AED$	Alternate interior angles are congruent
3. $\triangle ABC \sim \triangle AED$	AA
4. $\frac{m\overline{AB}}{m\overline{AE}} = \frac{m\overline{AC}}{m\overline{AD}}$	Corresponding sides of similar triangles are proportional
5. $m\overline{AC} = 2 \text{ cm}$	The product of the means of a proportion is equal to the product of the extremes

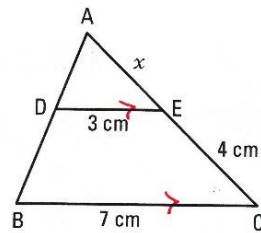
$$\frac{2.5}{4.5} = \frac{x}{3.6}$$

7. In the figure on the right, we have:

$\overline{DE} \parallel \overline{BC}$ ,  $m\overline{DE} = 3 \text{ cm}$ ,  $m\overline{BC} = 7 \text{ cm}$  and  $m\overline{EC} = 4 \text{ cm}$ .

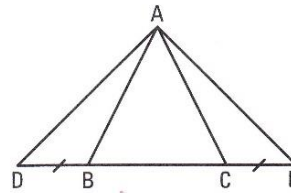
Complete and justify the following steps to find the measure of  $\overline{AE}$ .

$$\frac{3}{7} = \frac{x}{x+4} \Rightarrow 3x+12 = 7x \\ 12 = 4x \\ 3 = x$$



Statement	Justification
1. $\triangle ADE \sim \triangle ABC$	AA
2. $\frac{m\overline{DE}}{m\overline{BC}} = \frac{m\overline{AE}}{m\overline{AC}}$	Corresponding sides of similar triangles are proportional
3. $m\overline{AE} = 3 \text{ cm}$	The product of the means of a proportion is equal to the product of the extremes

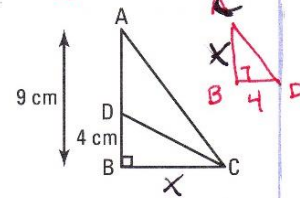
8. Triangle ABC is isosceles with principal vertex A and the segments BD and CE are congruent. Complete and justify the steps proving that triangle ADE is isosceles.



Hypothesis: 1.  $\triangle ABC$  is isosceles 2.  $\overline{BD} \cong \overline{CE}$   
 Consider triangles ABD and ACE.

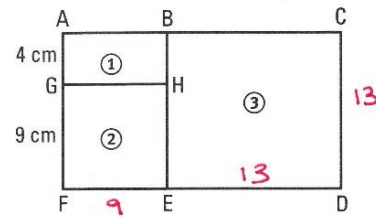
Statement	Justification
1. $\angle ABC \cong \angle ACB$	The two non-principal angles in an isosceles triangle are congruent
2. $\angle ABD \cong \angle ACE$	Angles supplementary to congruent angles are congruent
3. $\overline{BD} \cong \overline{CE}$	by hypothesis
4. $\overline{AB} \cong \overline{AC}$	Sides opposite congruent angles in an isosceles triangle are congruent
5. $\triangle ABD \cong \triangle ACE$	SAS
6. $\overline{AD} \cong \overline{AE}$	Corresponding sides of congruent triangles are congruent
7. $\triangle ADE$ is isosceles.	Two sides of the triangle are congruent

9. In the figure on the right, triangles ABC and CBD are similar. Find the perimeter of triangle ABC, to the nearest hundredth.

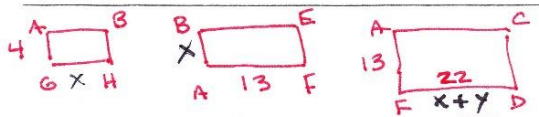


$\frac{4}{x} = \frac{x}{9} \Rightarrow x^2 = 36 \Rightarrow x = 6$        $\overline{AC} = \sqrt{36 + 81} = \sqrt{117} = 10.82$   
 $P = 9 + 6 + 10.8 = 25.82$       *wrong*

10. In the figure on the right, rectangles ①, ② and ③ are similar.

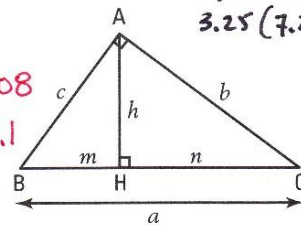


Determine the perimeter of rectangle ACDF.  
 72.87



$\frac{13}{x} = \frac{x}{4} \Rightarrow x^2 = 52 \Rightarrow x = 7.21$   
 $\frac{13}{y} = \frac{y}{4} \Rightarrow y = 7.21$   
 $3.25(7.21) = 23.44$

11. ABC is a right triangle in A and AH is the altitude from vertex A. Calculate the missing measures.



- a)  $b = 1.8; c = 2.4$        $a = 3 \quad h = 1.44 \quad m = 1.92 \quad n = 1.08$
- b)  $h = 10.8; b = 18$        $n = 14.4 \quad a = 22.5 \quad c = 13.5 \quad m = 8.1$
- c)  $h = 1.8; n = 2.4$        $b = 3 \quad a = 3.75 \quad c = 2.25 \quad m = 1.35$
- d)  $m = 1.8; n = 3.2$        $h = 2.4 \quad c = 3 \quad b = 4 \quad a = 5$
- e)  $a = 2.5; m = 0.9$        $c = 1.5 \quad b = 2 \quad h = 1.2 \quad n = 1.6$