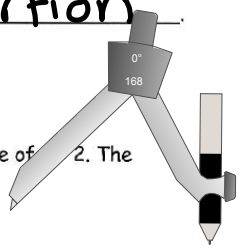
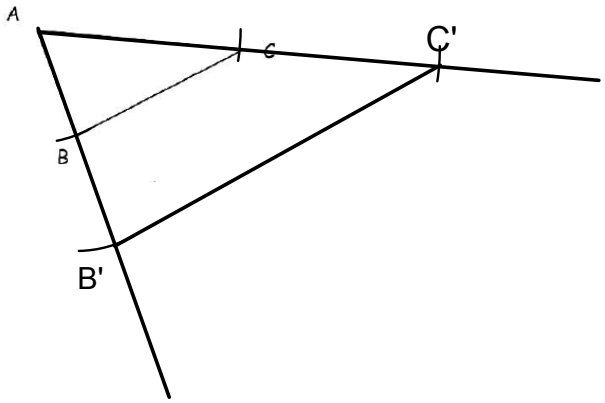
AIM: UNIT 7 Overview

1. The corresponding angles of similar polygons are $\cong$ and the corresponding sides of similar polygons are In proportion.



2. Use construction tools to create a scale drawing of ΔABC with a scale of 2. The center of dilation is point A.



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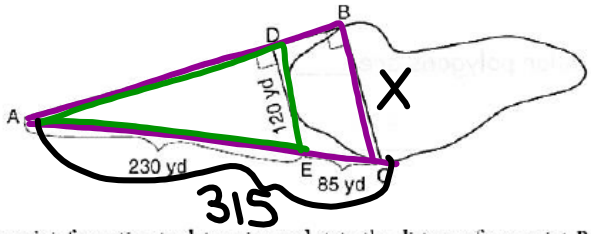
3. To find the distance across a pond from point B to point C, a surveyor drew the diagram below. The measurements he made are indicated on his diagram.



Use the surveyor's information to determine and state the distance from point B to point C, to the *nearest yard*.

$$\frac{\text{little side}}{\text{little base}} = \frac{\text{Big Side}}{\text{Big base}}$$

$$\frac{230}{120} = \frac{315}{X}$$

164 yards

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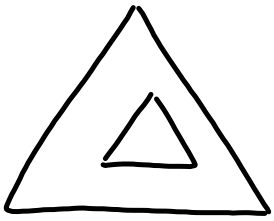
4. A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?

(1) The area of the image is nine times the area of the original triangle.

(2) The perimeter of the image is nine times the perimeter of the original triangle.

(3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.

(4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

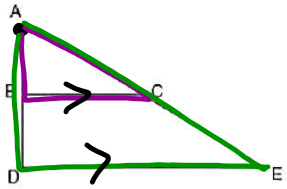


Ratio of Sides = Ratio of Perimeters

$\left(\text{Ratio of Sides}\right)^2 = \text{Ratio of Areas}$

$\left(\frac{3}{1}\right)^2 = \frac{9}{1}$

5. The image of $\triangle ABC$ after a dilation of scale factor k centered at point A is $\triangle ADE$, as shown in the diagram below.



Which statement is always true?

(1) $2AB = AD$

(2) $\overline{AD} \perp \overline{DE}$

(3) $AC = CE$

(4) $\overline{BC} \parallel \overline{DE}$

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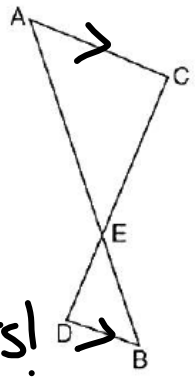
6. As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.



order matters!

Given $\triangle AEC \sim \triangle BED$, which equation is true?

(1) $\frac{CE}{DE} = \frac{EB}{EA}$

(2) $\frac{AE}{BE} = \frac{AC}{BD}$

(3) $\frac{EC}{AE} = \frac{BE}{ED}$

(4) $\frac{ED}{EC} = \frac{AC}{BD}$

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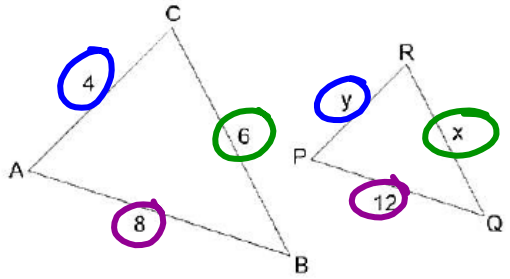
7. If $\Delta ABC \sim \Delta PQR$, find the value of x and y.



Find X

$\frac{8}{12} = \frac{6}{x}$

$X = 9$

Find Y

$\frac{8}{12} = \frac{4}{y}$

$y = 6$

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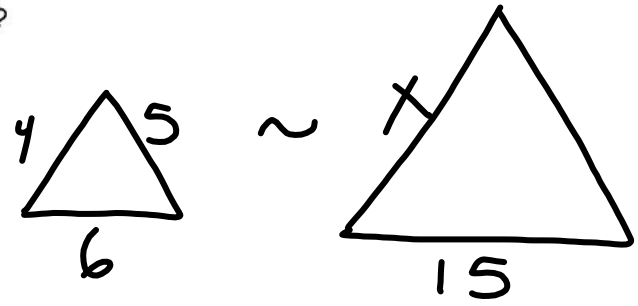
8. The lengths of the sides of a triangle are 4, 5, and 6. If the length of the longest side of a similar triangle is 15, what is the length of the *shortest side* of the triangle, the *longest side*?



$\frac{6}{15} = \frac{4}{x}$

$6x = 60$

$x = 10$

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9. The lengths of the sides of a triangle are 5, 12, and 13. What is the length of the *longest side* of a similar triangle whose perimeter is 90?

Ratio of sides = Ratio of Perimeters

$$\frac{13}{x} = \frac{30}{90}$$

$$x = 39$$

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10. Find the ratio of the areas of two similar triangles in which the ratio of a pair of corresponding sides is 2:5.

$$\left(\text{Ratio of sides}\right)^2 = \text{Ratio of areas}$$

$$\left(\frac{2}{5}\right)^2 = \frac{4}{25}$$

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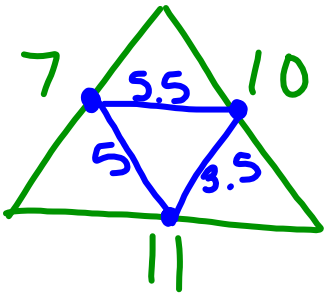
11. A triangle has sides of length 7, 10, and 11. What is the perimeter of the triangle formed by joining the midpoints of these sides?

Per. meter of Δ formed by the midsegments $= \frac{1}{2}$ Per. of the original triangle



14

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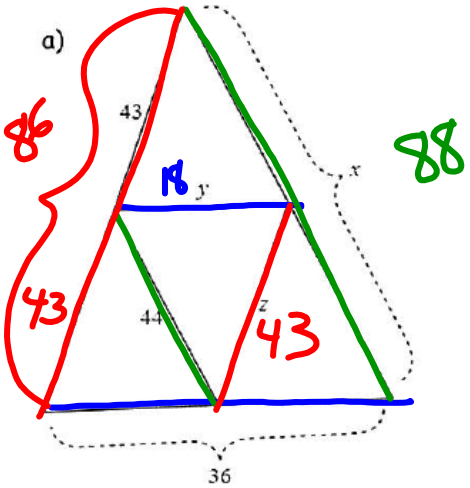
13. Each diagram below shows a triangle and its mid-segments. Find the indicated values.

a)

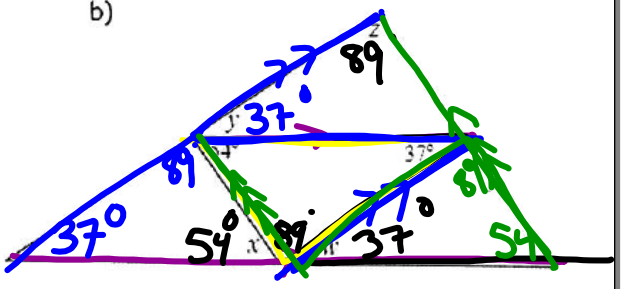


y = 18

x = 88

z = 43

b)



w = 37°

x = 54°

z = 89°

y = 37°

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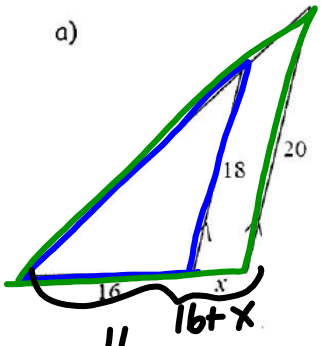
14. Find the indicated length in each case below. Round to the nearest tenth, if necessary.

a)



$\frac{16}{18} = \frac{16+x}{20}$

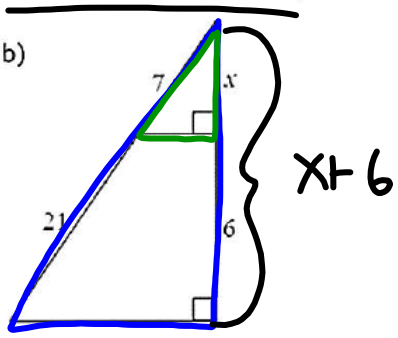
$16(20) = 18(16+x)$

$320 = 288 + 18x$

$18x = 32$

$x \approx 1.8$

b)



$\frac{x}{7} = \frac{x+6}{28}$

$28x = 7(x+6)$

$28x = 7x + 42$

$21x = 42$

$x = 2$

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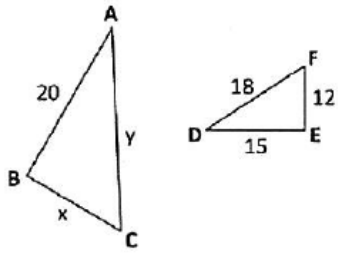
Use the diagram below to answer the following questions. Assume ΔABC ~ ΔDEF.

12. Find the scale factor of the small triangle to the large triangle.

13. Find the value of x and y.



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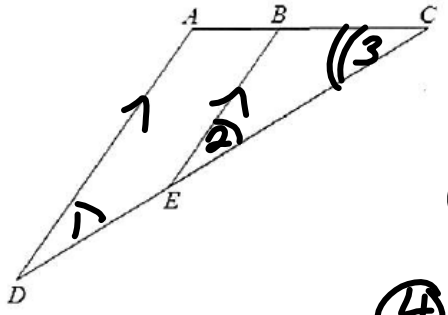
15. Given: $\overline{AD} \parallel \overline{BE}$

Prove: $\frac{AC}{BC} = \frac{DC}{EC}$



S	R
① $\overline{AD} \parallel \overline{BE}$	① Given
② $\angle 1 \cong \angle 2$	② If ~~⇒~~ → ~~△~~
③ $\angle 3 \cong \angle 3$	③ Reflexive prop.
④ $\triangle ACD \sim \triangle BCE$	④ AA ~
⑤ $\frac{AC}{BC} = \frac{DC}{EC}$	⑤ Corresponding Sides of ~ △'s are in prop.

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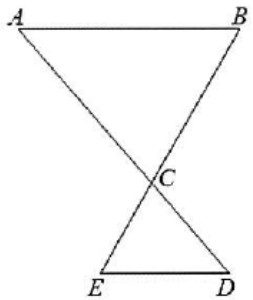
16. Given: $\angle BAC \cong \angle EDC$

Prove: $AB \times CD = ED \times AC$



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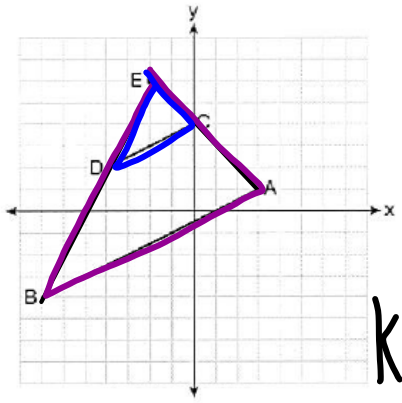
17. In the diagram below, $\overline{CD}$ is the image of $\overline{AB}$ after a dilation of scale factor k with center E.



Blue
Ripple
order
Matters

$\frac{\overline{CD}}{\overline{AB}}$

$k = \frac{\text{Image}}{\text{Pre-image}}$

$\frac{\text{New}}{\text{old}}$

Which ratio is equal to the scale factor k of the dilation?

(1) $\frac{EC}{EA}$

(2) $\frac{BA}{EA}$

(3) $\frac{EA}{BA}$

(4) $\frac{EA}{EC}$

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