



# SOLVING SIMILAR TRIANGLES 1

The Weight Room

<p><math>\triangle CAT \sim \triangle OGD</math></p>	<ol style="list-style-type: none"> <li>On the diagram, mark the congruent angles.</li> <li>Write a proportion relating all the sides of the two triangles. <math>\frac{CA}{OG} = \frac{AT}{GD} = \frac{CT}{OD}</math></li> <li>Write congruency statements for the three pairs of congruent angles.</li> </ol> <p><math>\angle C \cong \angle O, \angle A \cong \angle G, \angle T \cong \angle D</math></p>
<p><math>\triangle ARB \sim \triangle OGT</math></p> <p><math>\frac{a}{36} = \frac{36}{48} = \frac{3}{4}</math>    <math>\frac{30}{b} = \frac{3}{4}</math></p>	<ol style="list-style-type: none"> <li>Mark the congruent angles.</li> <li>Find <math>a</math> and <math>b</math>. <math>a = 27, b = 40</math></li> </ol> <p>Note that the diagram is not necessarily to scale.</p>
<p><math>\triangle WAK \sim \triangle KAL</math></p>	<ol style="list-style-type: none"> <li>Explain what is wrong with the following proportion, and then write it correctly.</li> </ol> <p><math>\frac{27}{KA} = \frac{KA}{AL} = \frac{60}{45}</math>    <math>\frac{27}{KA} \rightarrow \frac{KA}{AL} = \frac{45}{60} = \frac{3}{4}</math></p> <ol style="list-style-type: none"> <li>Find <math>c</math>. <math>c = 36 \text{ cm}</math></li> <li>There are three triangles that are similar. <math>\triangle WAK \sim \triangle KAL \sim \triangle WKL</math> Write a similarity statement for all three.</li> <li>Find <math>WL</math>. <math>\frac{27}{45} = \frac{3}{5} = \frac{45}{WL}</math>    <math>WL = 75 \text{ cm}</math></li> </ol>
<p><math>\triangle HWA \sim \triangle ESL</math></p>	<ol style="list-style-type: none"> <li>Write a similarity statement. <math>\triangle HWA \sim \triangle ESL</math></li> <li>Find <math>x</math>. <math>\frac{4x+1}{15} = \frac{5x+5}{21} \Rightarrow x = 6</math></li> <li>What is the scale factor going from the larger to the smaller triangle? <math>\frac{21}{15} = \frac{7}{5}</math></li> <li>If <math>WH = 38 \text{ mm}</math>, what is the perimeter of the smaller triangle?</li> </ol> <p><math>\frac{5}{7} = \frac{38 + 15 + x}{x}</math></p> <p><math>x = 58.8</math></p>

	<p>14. Find <math>x</math>. <math>\frac{8x-2}{5x+1} = \frac{42}{28} = \frac{3}{2} \Rightarrow x=7</math></p> <p>15. Find <math>y</math>. <math>\frac{y}{y+16} = \frac{2}{3} \Rightarrow y=32</math></p> <p>16. Show that the perimeters are proportional to the sides.</p> <p><math>\frac{3}{2} = \frac{144}{96} \checkmark</math></p>
<p><math>\frac{2}{3} = \frac{69}{x}</math></p>	<p>17. Find <math>x</math>. <math>\frac{66}{99} = \frac{2}{3} = \frac{4x+4}{7x-3} \Rightarrow x=9</math></p> <p>18. Find the perimeter of the larger triangle.</p> <p><math>p = 99 + 60 + 103.5 = 262.5</math></p>
<p>BARK ~ MEOW</p>	<p>19. Find <math>m</math>. <math>\frac{12}{30} = \frac{2}{5} = \frac{12}{m} \Rightarrow m = 32.5</math></p> <p>20. Find <math>n</math>. <math>\frac{2}{5} = \frac{n+2}{3n+1} \Rightarrow n=8</math></p> <p>21. If the perimeter of the larger quadrilateral is 107.5 mm, what is the perimeter of the smaller one?</p> <p><math>\frac{2}{5} = \frac{x}{107.5} \Rightarrow x=43</math></p>
	<p>22. The perimeter of <math>\triangle SAN</math> is 36 cm. Find <math>x</math>.</p> <p>23. Find <math>y</math>.</p> <p><math>(2x+2)2 + 4x = 36 \Rightarrow x=4</math></p> <p><math>\frac{10}{14} = \frac{5}{7} = \frac{16}{y} \Rightarrow y=22.4</math></p>
	<p>24. Write a similarity statement. <math>\triangle ABR \sim \triangle NSI</math></p> <p>25. Copy the diagram onto a blank sheet of paper, and then make up a similar-triangle problem that you can share with others.</p>