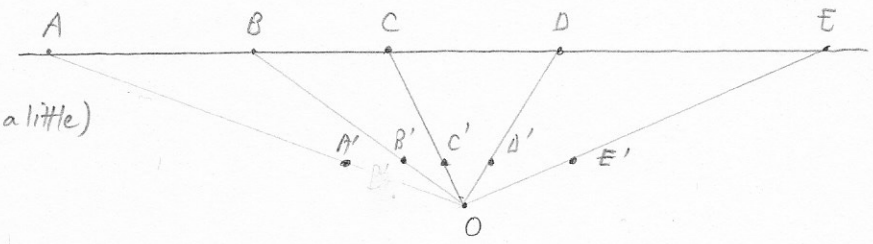
MATH 367 HW 9 SOLUTIONS

105. Dilation: scaling factor $\frac{4}{7}$, center P (other centers are possible)
Isometry: translation taking P to P'

107. Dilation: scaling factor $\frac{4}{3}$, center one of the vertices of the left triangle (other centers are possible)
Isometry: rotation, translation, reflection

108. (i) contraction
(ii) $\frac{2}{7}$ (answers will vary a little)
(iii)



115. Approximately $\frac{5}{8}$ (answers will vary a little – taking an average of several measured values is fine)

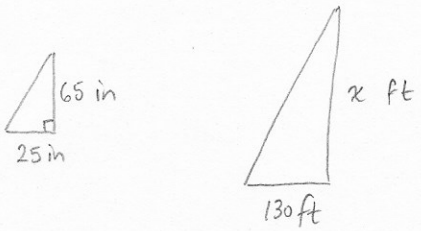
117. The scaling factor is $k = \frac{3}{2}$, so
$\ell(A'B') = \frac{3}{2} \cdot 8 = 12$, $\ell(B'C') = \frac{3}{2} \cdot 10 = 15$, $\ell(C'A') = \frac{3}{2} \cdot 12 = 18$

121. If the two triangles were similar, then by Theorem 116, the corresponding sides would be proportional, that is, $\frac{a'}{a} = \frac{b'}{b} = \frac{c'}{c}$. These values are:

$$\frac{51}{48} = 1.0625 \qquad \frac{85}{80} = 1.0625 \qquad \frac{121}{112} = 1.0803571\ldots$$

Since one of these values is different from the other two, the triangles cannot be similar.

131.



By Thm 118,

$$\frac{25}{65} = \frac{130}{x} \quad \text{so} \quad *$$

$$25x = (130)(65) = 8,450$$

$$x = 338$$

Answer: 338 feet

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* Note that the ratio $\frac{25}{65}$ is unitless, so we did not need to convert from inches to feet. If we did, then the ratio would be the same:

$$\frac{(25 \text{ in})\left(\frac{1 \text{ ft}}{12 \text{ in}}\right)}{(65 \text{ in})\left(\frac{1 \text{ ft}}{12 \text{ in}}\right)} = \frac{\frac{25}{12} \text{ feet}}{\frac{65}{12} \text{ feet}} = \frac{25}{65}$$