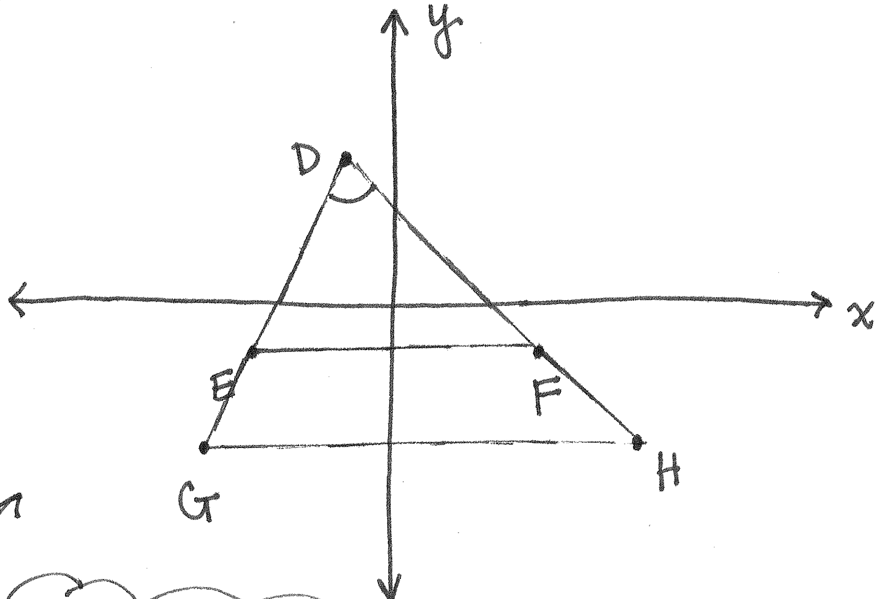
Practice Problems - Section 7.6
p. 499, #13 & 14

13) Given:
D(−1,3), E(−3,−1), F(3,−1), G(−4,−3), H(5,−3)



Prove: $\triangle DEF \sim \triangle DGH$

1) $\angle D \cong \angle D$ (Reflexive Prop.)

2) $m_{(\overline{EF})} = \frac{-1-(-1)}{3-(-3)} = \frac{0}{6} = 0$

$m_{(\overline{GH})} = \frac{-3-(-3)}{5-(-4)} = \frac{0}{9} = 0$

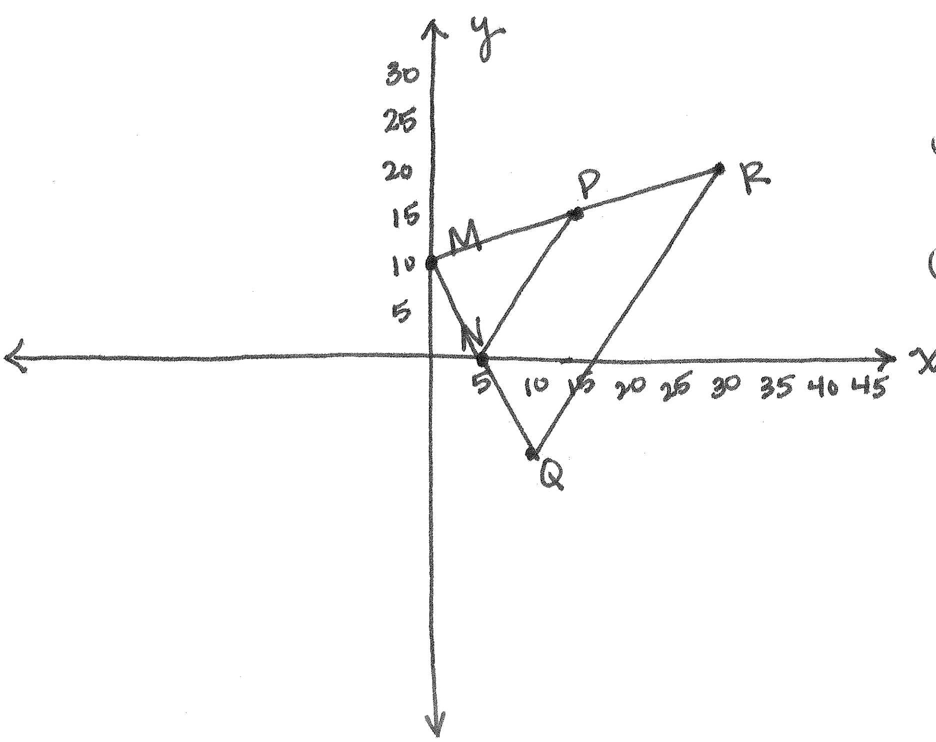
$\therefore \overleftrightarrow{EF} \parallel \overleftrightarrow{GH}$

So, $\angle DEF \cong \angle DGH$ (corres. ∠s)

$\triangle DEF \sim \triangle DGH$ by AA similarity.

* could use SAS or SSS for these!

14) Given:
M(0,10), N(5,0), P(15,15), Q(10,−10), R(30,20)



Prove: $\triangle MNP \sim \triangle MQR$

1) $\angle M \cong \angle M$ (Reflexive Prop.)

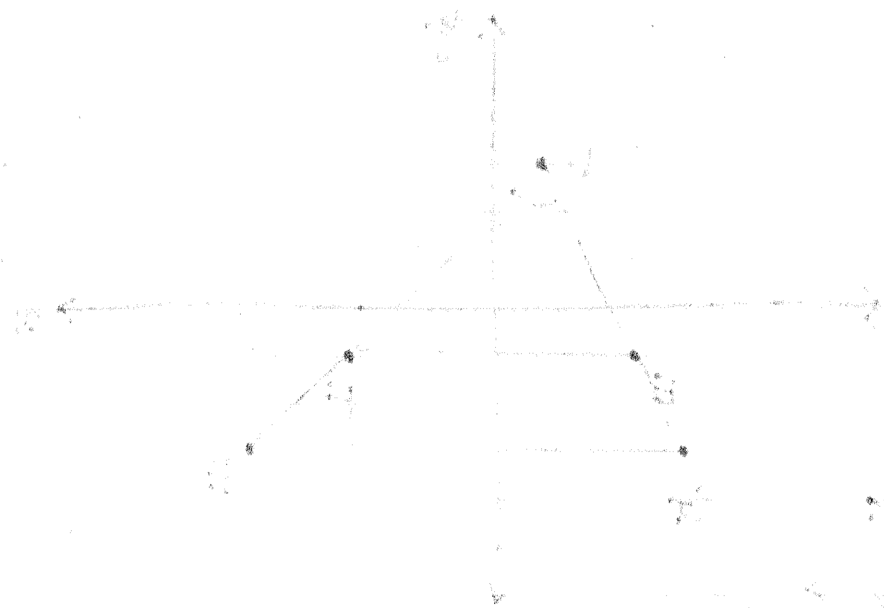
2) $m_{(\overline{NP})} = \frac{15-0}{15-5} = \frac{15}{10} = \frac{3}{2}$

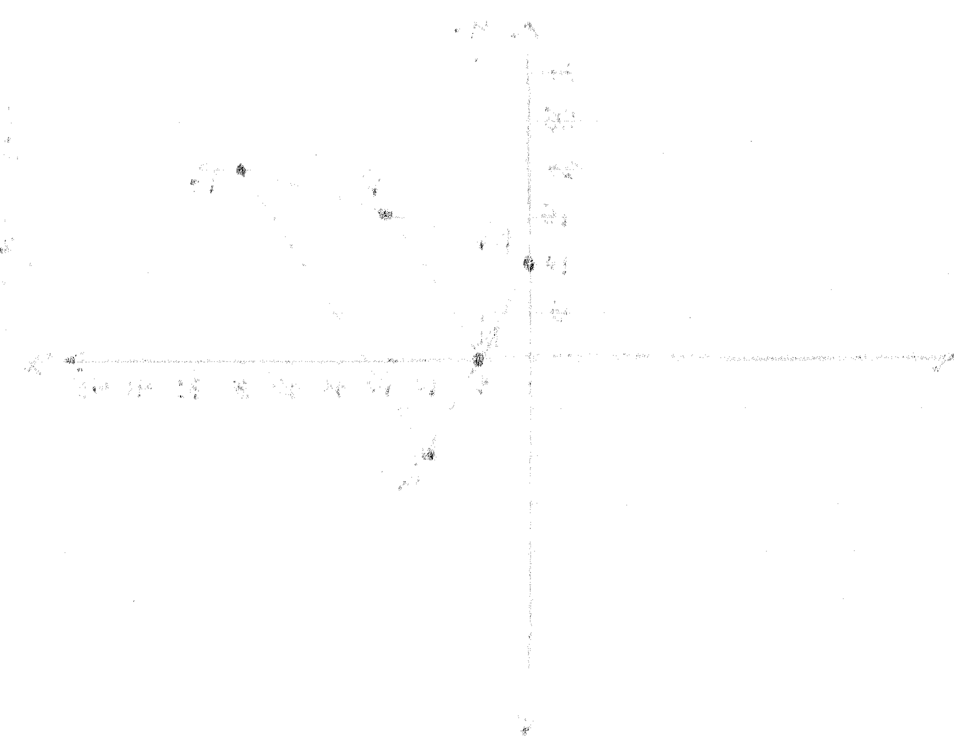
$m = \frac{20-(-10)}{30-10} = \frac{30}{20} = \frac{3}{2}$

$\therefore \overleftrightarrow{NP} \parallel \overleftrightarrow{QR}$

So, $\angle MNP \cong \angle MQR$ (corres. ∠s)

$\triangle MNP \sim \triangle MQR$ by AA similarity.





p. 503 - Practice Problems, #1-3, 8-12

1. $\frac{12}{14} = \frac{16}{ST}$

$12(ST) = 224$

$ST = \frac{56}{3}$

2. $\frac{6}{8} = \frac{4y-1}{5y}$

$30y = 32y - 8$

$-2y = -8$

$y = 4$

AB = 15
AC = 20

3. $\frac{3.6}{2.4} = \frac{FH}{2}$

$7.2 = 2.4(FH)$

FH = 3 cm

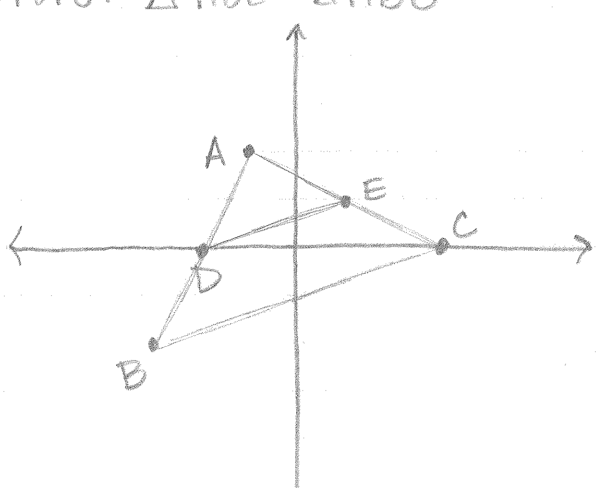
8. $\frac{70}{480} = \frac{63}{x}$

$70x = 30240$

$x = 432$ in

36 feet

9. Given: A(-1,2), B(-3,-2), C(3,0), D(-2,0), E(1,1)
Prove: $\triangle ADE \sim \triangle ABC$



① $\angle A \cong \angle A$ (reflexive Prop.)

② $m_{(\overline{DE})} = \frac{1-0}{1+2} = \frac{1}{3}$

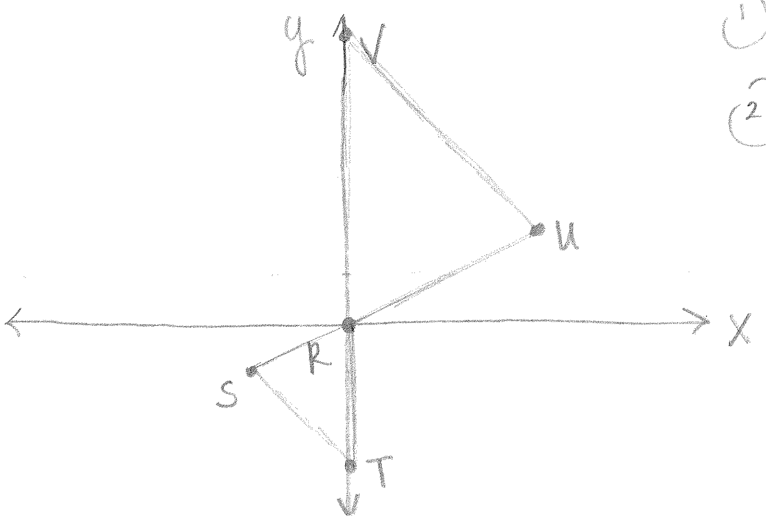
$m_{(\overline{BC})} = \frac{0+2}{3+3} = \frac{2}{6} = \frac{1}{3}$

$\therefore \overline{DE} \parallel \overline{BC}$

$\angle ADE \cong \angle ABC$ (corres. ∠s)

$\therefore \triangle ADE \sim \triangle ABC$ By AA similarity.

10. Given: R(0,0), S(-2,-1), T(0,-3), U(4,2), V(0,6)
Prove: $\triangle RST \sim \triangle RUV$



(1) $\angle SRT \cong \angle URV$ (vertical $\angle$s)

(2) $VR = \sqrt{(0-0)^2+(6-0)^2} = \sqrt{36} = 6$
$TR = \sqrt{(-3-0)^2+(0-0)^2} = \sqrt{9} = 3$

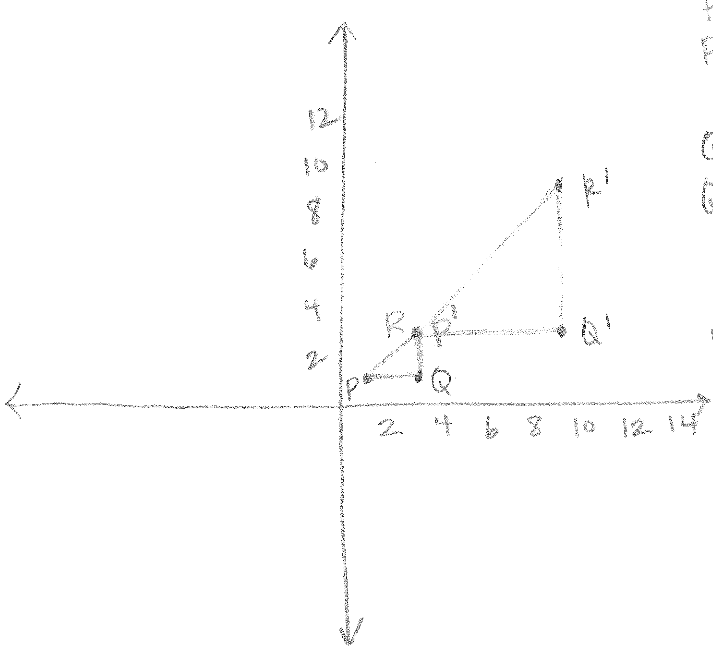
$UR = \sqrt{(4-0)^2+(2-0)^2} = \sqrt{20} = 2\sqrt{5}$
$SR = \sqrt{(-2-0)^2+(-1-0)^2} = \sqrt{5}$

$$\frac{VR}{TR} = \frac{UR}{SR} \Rightarrow \frac{6}{3} = \frac{2\cancel{\sqrt{5}}}{\cancel{\sqrt{5}}}$$
$2 = 2$ ✓
(sides proportional)

* Could use AA – must show $\overline{ST} \parallel \overline{UV}$.
use alt. int $\angle$s
* could use SSS – all sides proportional

$\triangle RST \sim \triangle RUV$
by SAS similarity

11. $P(1,1) \rightarrow P'(3,3)$
$Q(3,1) \rightarrow Q'(9,3)$
$R(3,3) \rightarrow R'(9,9)$



verify $\triangle P'Q'R' \sim \triangle PQR$

$PQ = \sqrt{(1-3)^2+\cancel{(1-1)^2}} = 2$
$P'Q' = \sqrt{(3-9)^2+\cancel{(3-3)^2}} = 6$

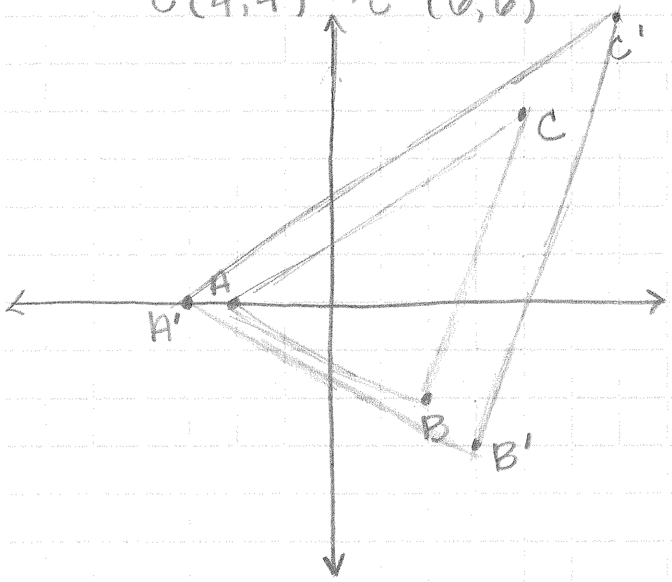
$QR = \sqrt{\cancel{(3-3)^2}+(1-3)^2} = 2$
$Q'R' = \sqrt{\cancel{(9-9)^2}+(3-9)} = 6$

$PR = \sqrt{(1-3)^2+(1-3)^2} = \sqrt{8} = 2\sqrt{2}$
$P'R' = \sqrt{(3-9)^2+(3-9)^2} = \sqrt{72} = 6\sqrt{2}$

$$\frac{\triangle P'Q'R'}{\triangle PQR} \Rightarrow \frac{6}{2} = \frac{6}{2} = \frac{6\cancel{\sqrt{2}}}{2\cancel{\sqrt{2}}}$$
$3 = 3 = 3$ ✓

$\triangle P'Q'R' \sim \triangle PQR$
by SSS similarity

12. $A(-2,0) \rightarrow A'(-3,0)$
$B(2,-2) \rightarrow B'(3,-3)$
$C(4,4) \rightarrow C'(6,6)$



Verify $\triangle A'B'C' \sim \triangle ABC$

$$AB = \sqrt{(-2-2)^2+(0+2)^2} = \sqrt{20} = 2\sqrt{5}$$
$$A'B' = \sqrt{(-3-3)^2+(0+3)^2} = \sqrt{45} = 3\sqrt{5}$$

$$BC = \sqrt{(2-4)^2+(-2-4)^2} = \sqrt{40} = 2\sqrt{10}$$
$$B'C' = \sqrt{(3-6)^2+(-3-6)^2} = \sqrt{90} = 3\sqrt{10}$$

$$AC = \sqrt{(-2-4)^2+(0-4)^2} = \sqrt{52} = 2\sqrt{13}$$
$$A'C' = \sqrt{(-3-6)^2+(0-6)^2} = \sqrt{117} = 3\sqrt{13}$$

$$\frac{\triangle A'B'C'}{\triangle ABC} = \frac{3\cancel{\sqrt{5}}}{2\cancel{\sqrt{5}}} = \frac{3\cancel{\sqrt{10}}}{2\cancel{\sqrt{10}}} = \frac{3\cancel{\sqrt{13}}}{2\cancel{\sqrt{13}}}$$
$$\frac{3}{2} = \frac{3}{2} = \frac{3}{2}$$

$\triangle A'B'C' \sim \triangle ABC$
By SSS similarity