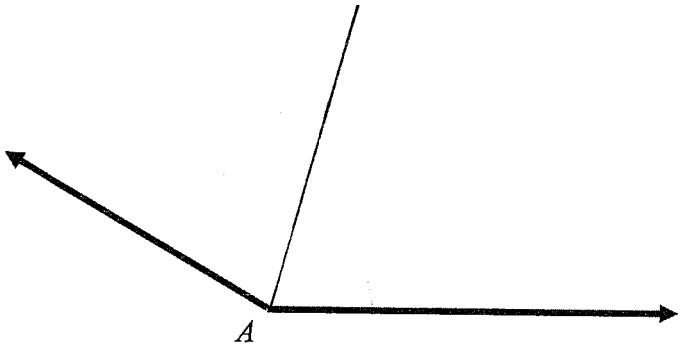
Items on this review are grouped by Unit/Topic

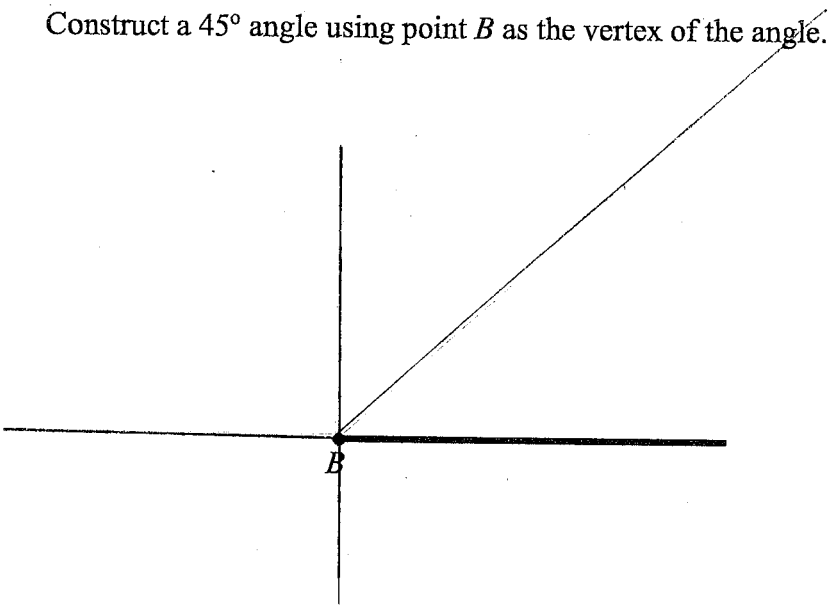
Unit 1, Topic 1

1. Write the three undefined terms in geometry.

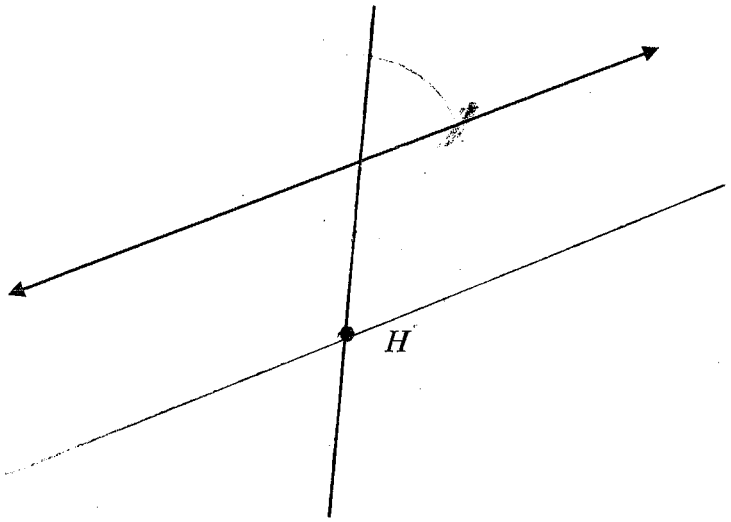
2. Construct the angle bisector of angle A below.



3. Construct a 45° angle using point B as the vertex of the angle.



4. A road construction crew wishes to construct a new road parallel to the current road, and passing through the town of Herkimer, marked by point H below. Construct the location of the road.



5. The perpendicular bisector of $\overline{AB}$ is constructed. What is true about every point on that perpendicular bisector?

equidistant from A & B

6. The angle bisector of $\angle CDE$ is constructed. What is true about every point on the angle bisector?

equidistant from $\overrightarrow{DC}$ & $\overrightarrow{DE}$

7. A line is constructed parallel to a given line. What is true about the lines?

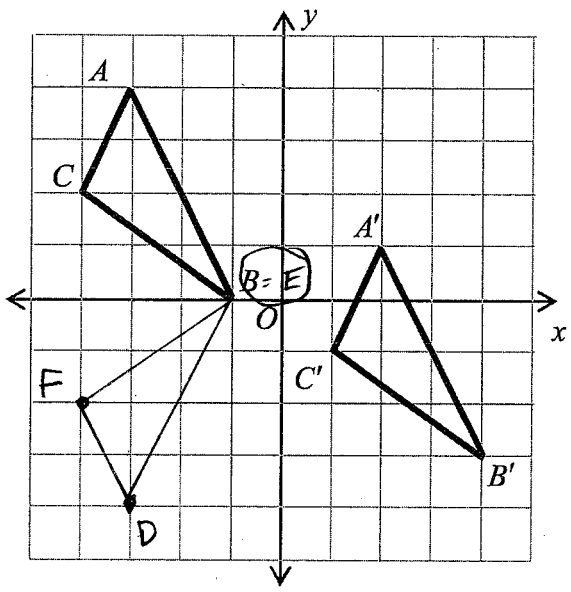
- they never intersect
- they have the same slope

Unit 1, Topic 2

8. Point $A(-1,-4)$ is to be transformed to point A' using the translation rule $(x,y)\rightarrow(x-3,y+6)$. What are the coordinates of point A'? $(-4, 2)$

9. Triangle ABC has been transformed to triangle $A'B'C'$.

$(x,y) \rightarrow (x+5, y-3)$



a. State in words, the transformation(s) that produce triangle $A'B'C'$.

right by 5, down 3

b. Write a function rule that represents this transformation.

$(x,y) \rightarrow (x+5, y-3)$

c. Why must $\Delta ABC \cong \Delta A'B'C'$?

translation is isometric

d. On the coordinate plane above, sketch the reflection of Δ ABC across the x-axis. Label the triangle DEF. Write the function rule for this transformation.

$(x, y) \rightarrow (x, -y)$

10. Let (x, y) be a point on the coordinate plane. Write the coordinates of the image point if (x, y) undergoes the following transformations.

a. Reflected across the x-axis. $(x,y) \rightarrow (x,-y)$

b. Reflected across the y-axis. $(x,y) \rightarrow (-x,y)$

c, Translated six units to the right and two units downward. $(x,y) \rightarrow (x+6, y-2)$

d. Rotated clockwise 90 degrees about the origin. $(x,y) \rightarrow (-y,-x)$

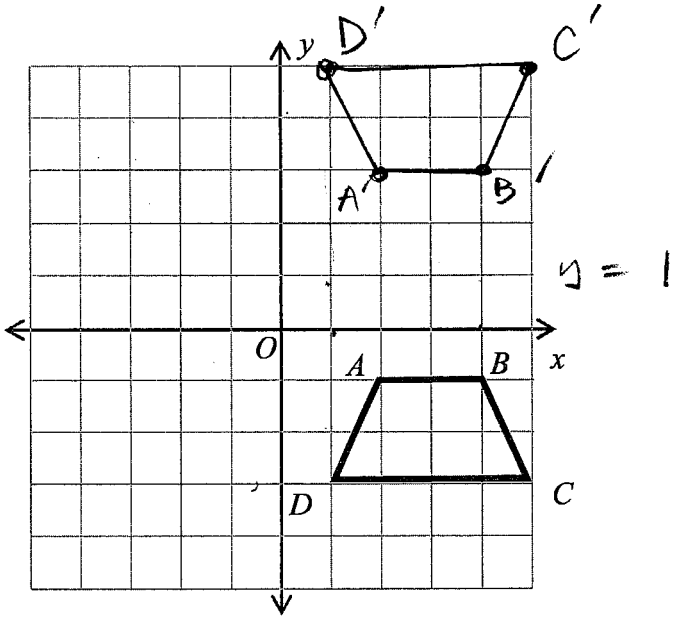
e. Rotated 180 degrees about the origin. $(x,y) \rightarrow (-x,-y)$

f. Rotated counter-clockwise 90 degrees about the origin. $(x,y) \rightarrow (-y, x)$

g. Translated two units down, then reflected about the x-axis. $(x,y) \rightarrow (x, y-2) \rightarrow (x, 2-y)$

h. Reflected across the line $x = 1$. $(x,y) \rightarrow (1-x, y)$

11.



a. Reflect the figure above across the line $y = 1$. Label the image $A'B'C'D'$.

b. Does this transformation preserve lengths and angle measurements? Justify your answer. yes reflection is isometric

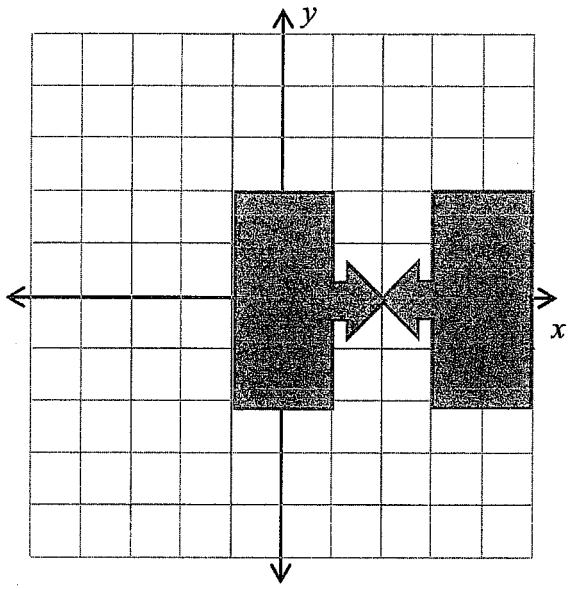
c. If the figure was reflected across the x-axis, then translated two units upward, would the result be the same as the transformation in part a) ?

yes

12. Write the three rigid (isometric) transformations. translation, rotation, reflection

13. If a figure undergoes a rigid transformation, then the transformed figure must be congruent to the original figure.

14. Look at the figure below.

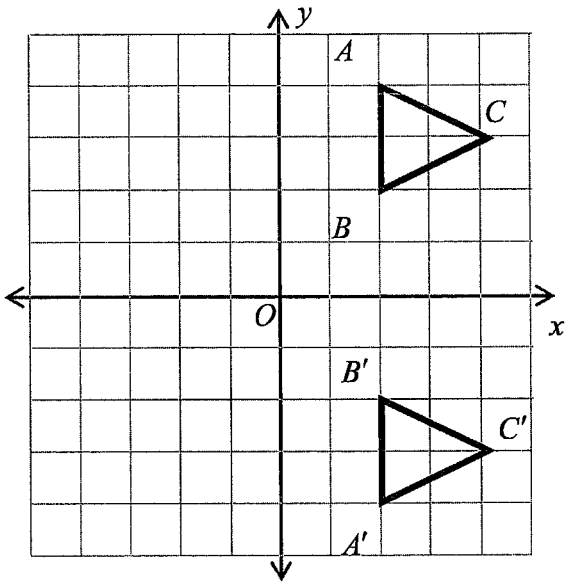


Complete each statement such that each transformation will map the triangle onto itself.

a. A reflection across the X− axis or the line $x = 2$.

b. A rotation of 180° degrees about the point (0,2).

15. Triangle ABC undergoes a transformation to produce triangle $A'B'C'$. The triangles are shown below.



a. Is the transformation above a single reflection? Justify your answer.

yes, reflection around $y=0$ (or the x-axis)

b. Is the transformation above a translation? Justify your answer.

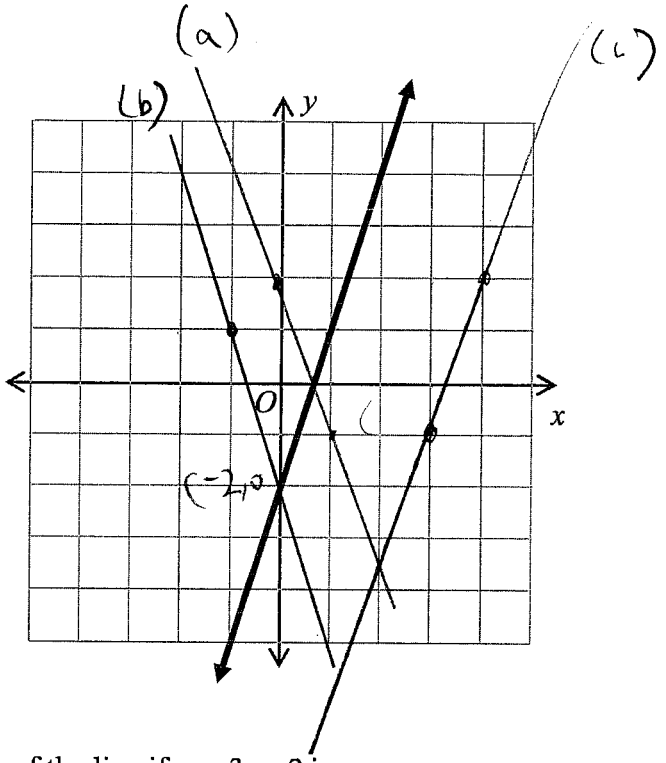
No, if translated, A's y > B's y coord.

c. Determine a transformation with <u>three</u> reflections that will produce triangle $A'B'C'$.

Reflect on $x=0$, then $y=0$, then $x=0$

(y-axis, x-axis, then y-axis)

16. The line $y = 3x - 2$ is graphed on the coordinate plane below.



Write the equation of the line if $y = 3x - 2$ is

a. reflected across the x-axis.

$y = -3x + 2$

b. reflected across the y-axis.

$y = -3x - 2$

c. translated three units to the right and one unit up. $(x, y) \rightarrow (x+3, y+1)$

$y + 1 = 3(x + 3) - 2$

$y = 3x + 9 - 2 + 1$

$y = 3x - 8$

Unit 1, Topic 3

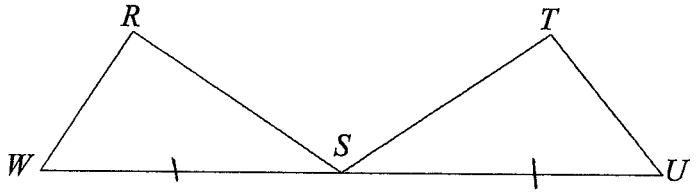
17. If figure *ABCD* is congruent to figure *EFGH*, write all eight side and angle congruence statements.

$\angle A \cong \angle E$, $\angle B \cong \angle F$, $\angle C \cong \angle G$, $\angle D \cong \angle H$

$\overline{AB} \cong \overline{EF}$, $\overline{BC} \cong \overline{FG}$, $\overline{CD} \cong \overline{GH}$, $\overline{AD} \cong \overline{EH}$

18. If all corresponding sides of two figures are congruent, and all corresponding angles of the two figures are congruent, then the figures must be congruent.

In the figure below, point *S* is the midpoint of $\overline{WU}$. Therefore $\overline{WS} \cong \overline{US}$.



You wish to prove $\Delta WSR \cong \Delta UST$.

19. To prove this congruence by SSS, what two additional congruence statements are needed? $\overline{WR} \cong \overline{UT}$ & $\overline{RS} \cong \overline{TS}$

20. To prove this congruence by SAS, what two additional congruence statements are needed? $\angle WSR \cong \angle UST$ & $\overline{RS} \cong \overline{TS}$

21. To prove this congruence by ASA, what two additional congruence statements are needed? $\angle RWS \cong \angle TUS$ & $\angle RSW \cong \angle TSU$

22. To prove this congruence by AAS, what two additional congruence statements are needed? $\angle R \cong \angle T$ & $\angle RSW \cong \angle TSU$

23. State two additional congruence statements that will be insufficient to prove the triangles congruent. $\angle RST \cong \angle TSU$ & $\overline{RW} \cong \overline{TU}$

24. Consuela wants to determine the length of a power line that will be stretched over a lake. She cannot walk through the lake. She was able to take some measurements, hoping to determine the length. Her measurements are shown below.

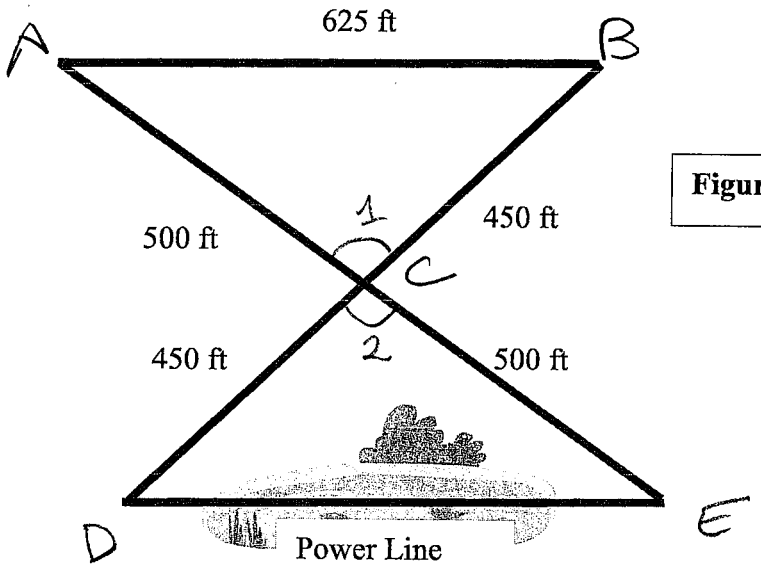


Figure NOT drawn to scale

Consuela believes that the length of the power line is 625 feet, but she's not sure how to explain this to her boss.

Using what you know about triangle congruence, help Consuela by writing a brief report as to why the length of the power line is 625 feet.

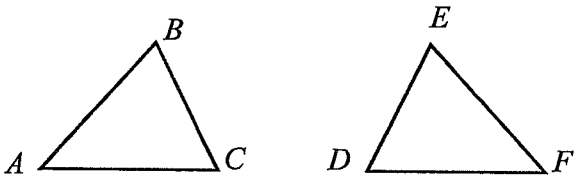
$\angle 1 \cong \angle 2$ (Vert $\angle$'s are $\cong$)

$\overline{BC} \cong \overline{DC}$ (by measurement)

$\overline{AC} \cong \overline{EC}$ (by measurement)

$\triangle ABC \cong \triangle EDC$ (by SAS $\cong$ Th)

Look at triangles *ABC* and *FED* below.



In items 9 through 14 below, information is given about the two triangles. State whether the triangles can be proven congruent by ASA, SSS, AAS, or SAS. If the triangles cannot be proven congruent, state why.

25. $\overline{AB} \cong \overline{FE}$, $\overline{AC} \cong \overline{FA}$, $\angle A \cong \angle F$.

not $\cong$ $\overline{FA}$ not a side of a $\triangle$

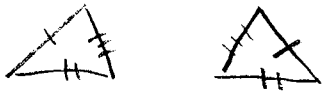
26. $\angle A \cong \angle F$, $\angle B \cong \angle E$, $\angle C \cong \angle D$.

similar, not $\cong$ so (AAA $\cong$ Theorem!)

27. $\angle A \cong \angle F$, $\angle B \cong \angle E$, $\overline{AB} \cong \overline{FE}$.

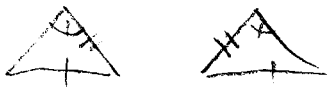
ASA $\cong$

28. $\overline{AB} \cong \overline{FE}$, $\overline{AC} \cong \overline{FD}$, $\overline{BC} \cong \overline{ED}$.



SSS $\cong$

29. $\angle B \cong \angle E$, $\overline{AC} \cong \overline{FD}$, $\overline{BC} \cong \overline{ED}$.



not $\cong$ (no ASS/SSA $\cong$ Thm)

30. $\angle A \cong \angle F$, $\overline{AB} \cong \overline{FE}$, $\angle C \cong \angle D$.

AAS $\cong$

Unit 1, Topic 4

31. Every quadrilateral that is a parallelogram has certain properties. List all these properties.

Opp sides $\cong$
Opp $\angle$'s $\cong$
Diagonals bisect each other

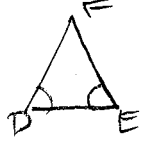
32. What properties does a rectangle have in addition to those of a parallelogram?

Diags are $\cong$
all angles $\cong$

33. What properties does a square have in addition to those of a rectangle?

Diags. bisect opp angles
Diags $\perp$ to each other
all sides $\cong$

34. Triangle DEF is isosceles with $\angle D \cong \angle E$. Which sides are congruent?



$\overline{FD} \cong \overline{FE}$

35. In the figure to the right,

Figure NOT drawn to scale

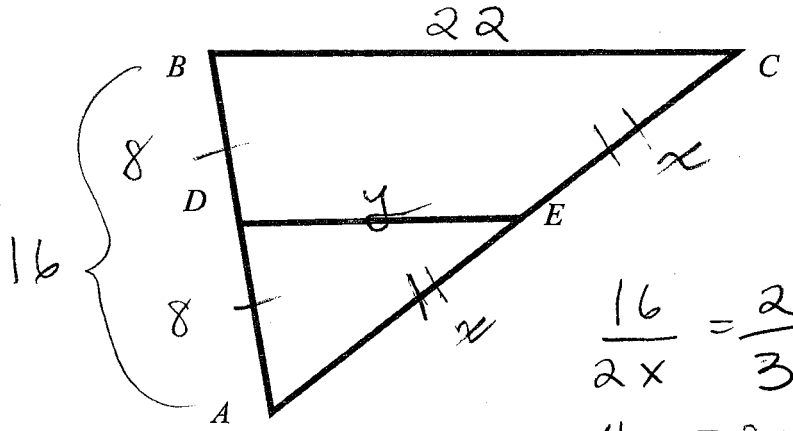
D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{AC}$.

$AD = 8$, $BC = 22$

The ratio of AB to AC is 2 to 3.

$\frac{AB}{AC} = \frac{2}{3}$

Determine the lengths of $\overline{EC}$ and $\overline{DE}$.



$\frac{8}{y} \quad \frac{16}{22}$

$y = \frac{8 \cdot 12}{16} = \frac{27}{2}$

$\overline{DE} = \frac{27}{2}$

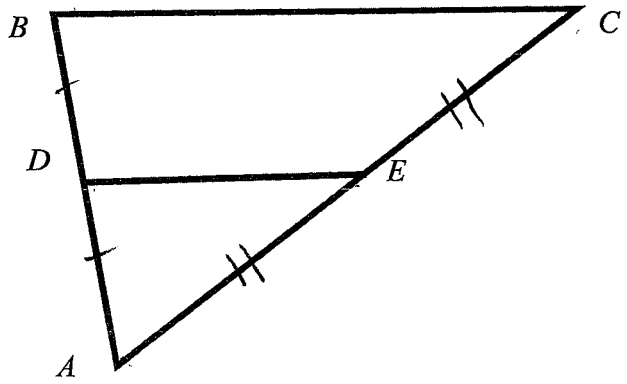
$\frac{16}{2x} = \frac{2}{3}$

$4x = 3 \cdot 16$

$x = 12$

$EC = 12$

36. In the figure below, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{AC}$.



Complete the statements using the items in the box on the right. Each item may be used more than once or not at all.

$\overline{AD}$	$\overline{AE}$
~~$\overline{DE}$~~ c	~~$\overline{BC}$~~ e
~~$\overline{EC}$~~ b	~~$\overline{BD}$~~ a
~~$\overline{DE}$~~ f	AD
~~$\overline{BC}$~~ f	~~EC~~ e
~~BD~~ d	AE
2:1 g	~~1:2~~ h

a. $\overline{AD} \cong$ $\overline{BD}$

b. $\overline{AE} \cong$ $\overline{EC}$

c. $\overline{DE}$ is parallel to $\overline{BC}$

d. $AD =$ BD

e. $AE =$ EA

f. $BC = 2 \times DE$

g. The ratio $AB : AD$ is $2:1$

h. The ratio $AE : AC$ is $1:2$

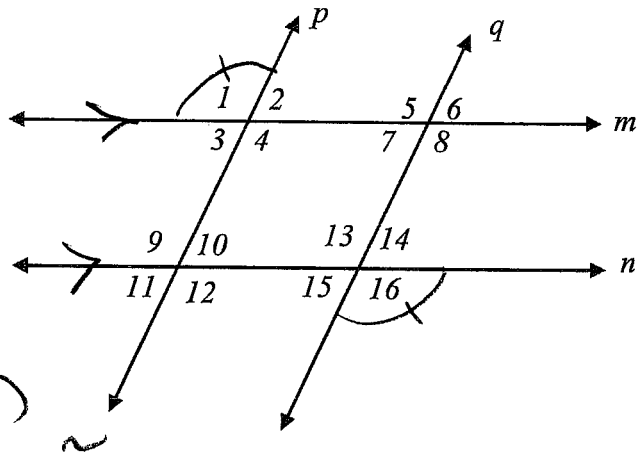
37. If two parallel lines are cut by a transversal:

a. Which angle pairs are congruent?

b. Which angle pairs are supplementary?

38. Given: $m \parallel n$, $\angle 1 \cong \angle 16$

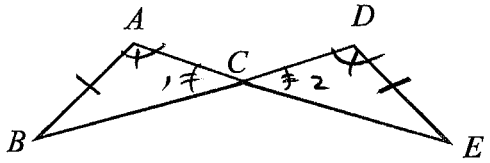
Prove: $p \parallel q$



$\angle 16 \cong \angle 8$ (Corr $\angle$'s)
$\angle 8 \cong \angle 5$ (Vert $\angle$'s)
$\angle 16 \cong \angle 5$ (Transitive)
$\angle 1 \cong \angle 16$ (Given)
$\angle 1 \cong \angle 5$ (Transitive)
$p \parallel q$ (if Corr $\angle$'s are $\cong$, the lines are parallel

39. Given: $\angle A \cong \angle D$
$\overline{AB} \cong \overline{DE}$

Prove: $\overline{CE} \cong \overline{CB}$



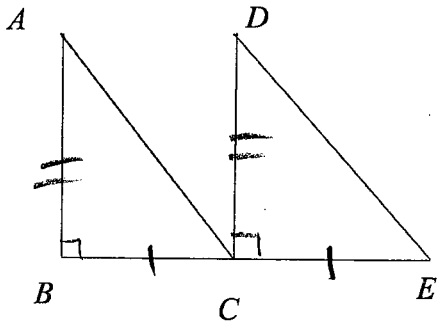
1) $\angle A \cong \angle D$	1) Given
2) $\angle 1 \cong \angle 2$	2) Vert $\angle$'s
3) $\overline{AB} \cong \overline{DE}$	3) Given
4) $\triangle CAB \cong \triangle CDE$	4) AAS $\cong$
5) $\overline{CE} \cong \overline{CB}$	5) Corr. parts of $\cong \triangle$'s

40. C is the midpoint of $\overline{BE}$.

Given: $\overline{AB} \cong \overline{DC}$

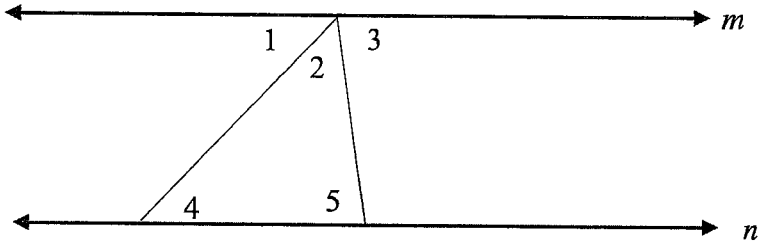
$\overline{AB} \perp \overline{BE}$, $\overline{DC} \perp \overline{BE}$

Prove: $\angle A \cong \angle D$



① $\overline{BC} \cong \overline{CE}$	① Def of mdpt
② $\overline{AB} \cong \overline{DC}$	② Given
③ $\angle B \cong \angle C$	③ Def $\perp$
④ $\triangle ABC \cong \triangle DCE$	④ SAS
⑤ $\angle A \cong \angle D$	⑤ CPCT $\cong$

41. Below is a figure that will help you prove that the sum of the angles of a triangle is 180 degrees. The two lines are parallel.



Write a proof for this theorem.

$m\angle 1 + m\angle 2 + m\angle 3 = 180°$ (Supp - straight line)

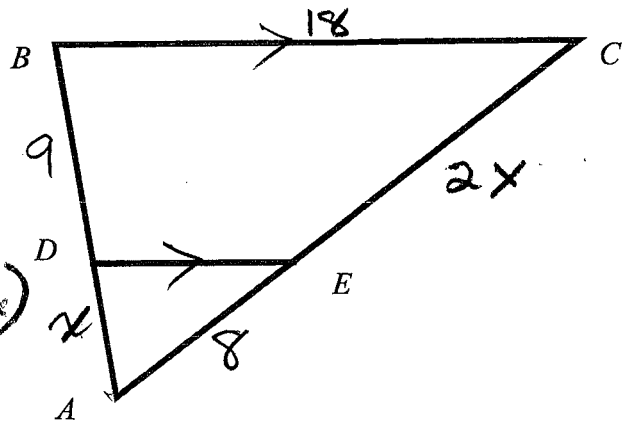
$m\angle 4 = m\angle 1$ (Alt Int $\angle$s)

$m\angle 5 = m\angle 3$ (Alt Int $\angle$s)

$m\angle 4 + m\angle 2 + m\angle 3 = 180°$ (Substitution)

Unit 2, Topic 1

Figure NOT drawn to scale



42. In the figure to the right, $\overline{DE} \parallel \overline{BC}$.

$CE = 2AD$, $AE = 8$, $BD = 9$, $BC = 18$

a. Prove that $\Delta ADE \sim \Delta ABC$.

$\angle A \cong \angle A$ (Reflex)

Due to $\parallel$ cutting the sides w/ same proportion

$$\frac{AD}{DB} = \frac{AE}{EC}$$

and $$\frac{AD}{AD+DB} = \frac{AE}{AE+EC}$$

$$\frac{AD}{AB} = \frac{AE}{AC}$$

$\Delta ADE \sim \Delta ABC$ (SAS ~)

b. Determine the length of $\overline{AD}$. =6 (see above)

$$\frac{AD}{BD} = \frac{AE}{EC} = \frac{8}{2AD}$$

$$\frac{AD}{9} = \frac{8}{2AD}$$

$2AD^2 = 72$, $AD^2 = 36$ $AD = 6$

c. Determine the length of $\overline{DE}$.

$$\frac{DE}{BC} = \frac{8}{2AD}$$

$$\frac{DE}{18} = \frac{8}{12}$$

$$DE = \frac{8 \cdot 18}{12} = 12$$

43. Jory wants to measure the length, ***L***, of a pond. The figure below shows the measurements she will use to determine the length of the pond.

In the figure below, $\overline{AE}$ and $\overline{BD}$ intersect at point C.

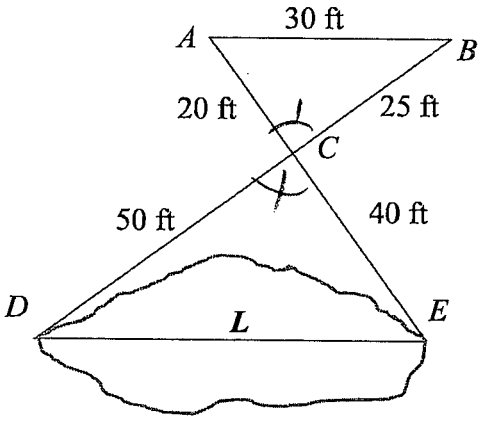


Figure NOT drawn to scale

a. Which similarity postulate/theorem may be used to prove $\triangle ABC \sim \triangle EDC$?

SAS ~

b. What is the length, ***L***, of the pond? Show how you determined your answer.

$\frac{20}{40} = \frac{25}{50} = \frac{1}{2}$

$\frac{AB}{DE} = \frac{1}{2}$

So $\frac{30}{DE} = \frac{1}{2}$

$DE = 60$

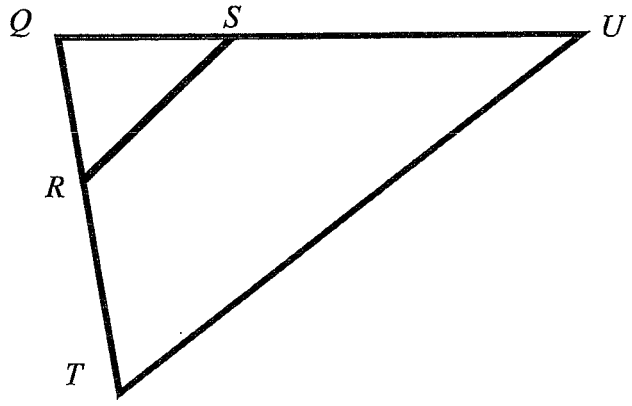
$L = 60\text{ ft.}$

44. If two figures are similar, then

a. Corresponding sides are _____ (proportional/congruent).

b. Corresponding angles are _____ (proportional/congruent).

45. In the figure below, $\Delta QRS \sim \Delta QTU$.



a. Prove that $\overline{RS} \parallel \overline{TU}$.

$\angle QRS \cong \angle QRT$ (sim Δs have $\cong$ $\angle$'s)

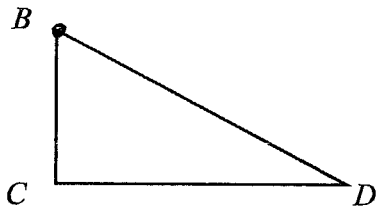
$RS \parallel TU$ (If corr $\angle$'s $\cong$, lines $\parallel$)

b. Write all congruences and proportions using the sides and angles in the figure.

$$\frac{QR}{QT} = \frac{QS}{QU}$$

$\angle QRS \cong \angle QRT$, $\angle QSR \cong \angle QUT$

46. The figure below shows ΔBCD . $\Delta B'C'D'$ will be the image of ΔBCD after a dilation with center B and scale factor 5.



Item Bank

B a

C

D

5 d

$\frac{1}{5}$ b, c

parallel to

on the same line as

perpendicular

Complete the statements using the item bank on the right.

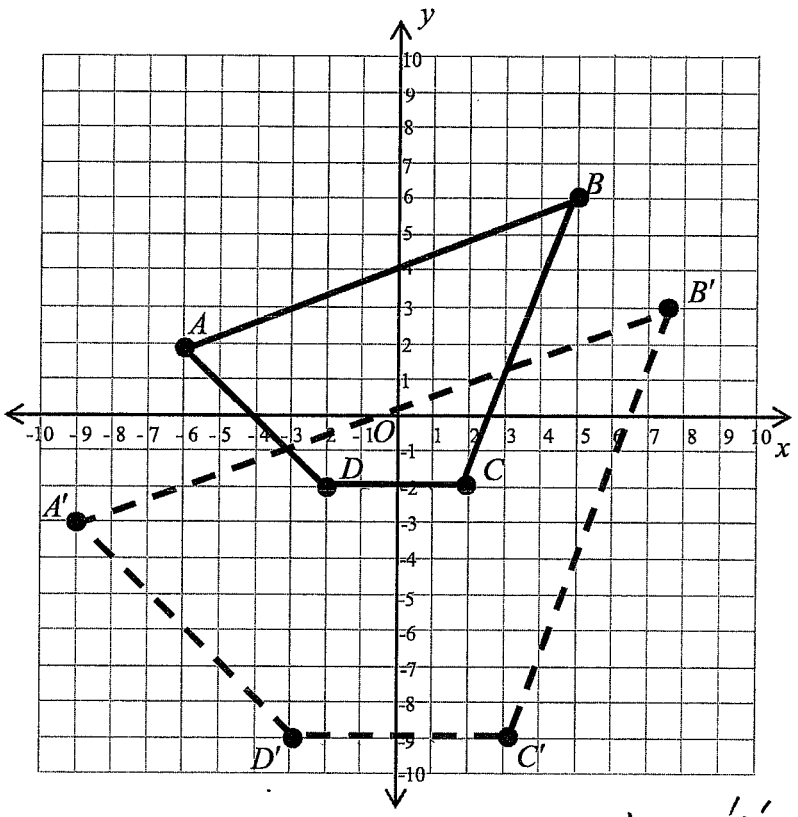
a. The point B' will be the same point as point B.

b. $\overline{C'D'}$ will be 1/5 $\overline{CD}$.

c. $\overline{B'C'}$ will be 1/5 $\overline{BC}$.

d. The perimeter of $\Delta B'C'D'$ will be 5 times the perimeter of ΔBCD .

47. On the graph below, quadrilateral $ABCD$ has been dilated, with the center of dilation the origin, then translated down six units, to create quadrilateral $A'B'C'D'$.



a. What is the scale factor of the dilation? $DC = 4$, $D'C' = 6$ so $\frac{3}{2}$ is the scale factor

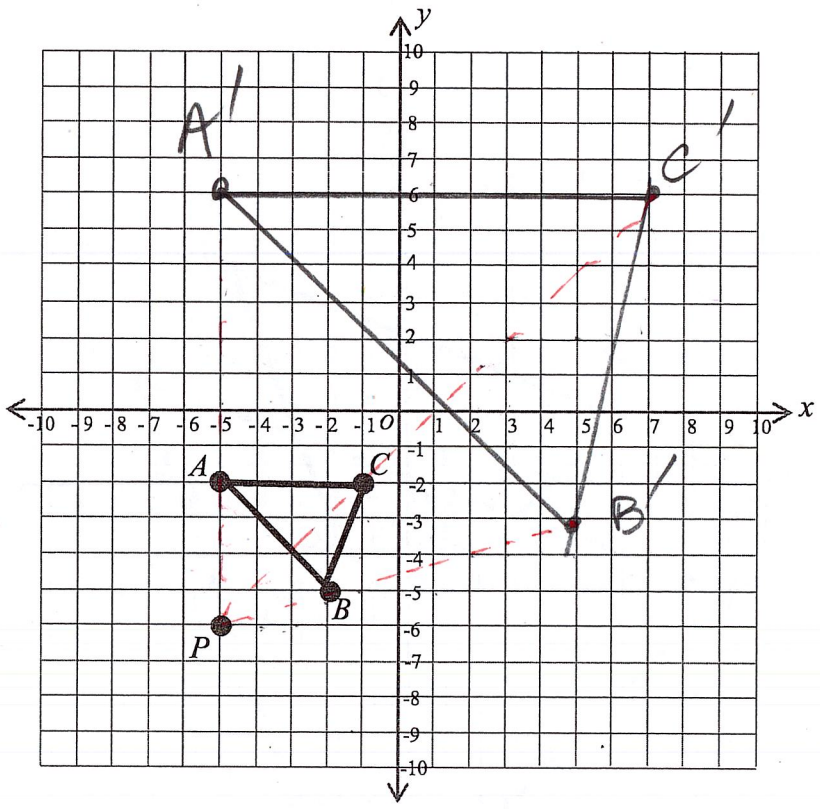
b. What is the ratio of the length of $\overline{AB}$ to the length of $\overline{A'B'}$?

$\frac{3}{2}$

c. How are the measures of $\angle A$ and $\angle A'$ related?

$\cong$

48. Triangle ABC is shown on the coordinate grid below.



Triangle ABC is to be dilated by a scale factor of three with the center of dilation the point $P(-5,-6)$ to produce triangle $A'B'C'$.

a. On the coordinate plane above, sketch $\Delta A'B'C'$.

b. What is the ratio of the perimeter of ΔABC to the perimeter of $\Delta A'B'C'$?

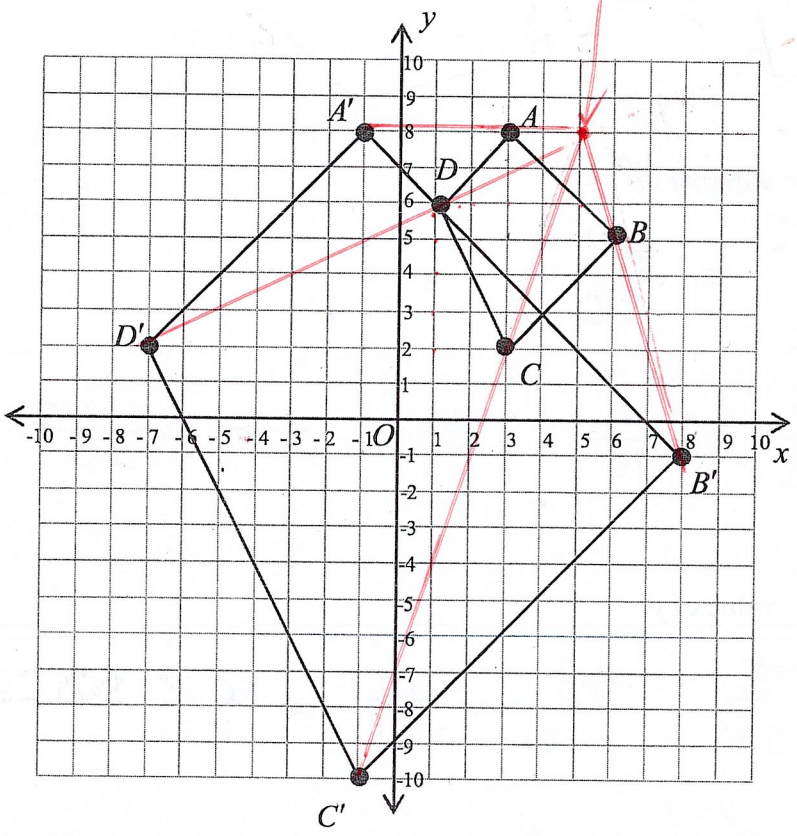
3

c. Is there a sequence of rigid transformations that will produce the same result? Justify your answer.

No, $\Delta A'B'C'$ is larger than ΔABC, but rigid transformation are isometric (preserving size)

49. Quadrilateral $ABCD$ has been dilated. The dilation results in the quadrilateral $A'B'C'D'$.

center of dilation



a. What is the scale factor of the dilation? 3

b. What point is the center of dilation? (5,8)

50. Pentagons *ABCDE* and *FGHIJ* are similar.

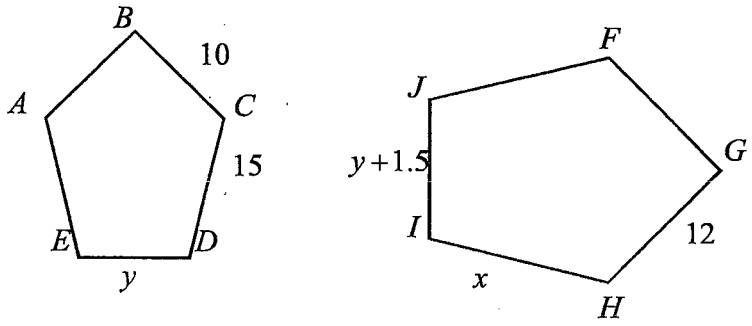


Figure NOT drawn to scale

a. What is the value of x?

$$\frac{HI}{CD} = \frac{GH}{BC}$$

$$\frac{x}{15} = \frac{12}{10} \quad \text{so} \quad x = \frac{12 \cdot 15}{10} = 18$$

b. What is the value of y?

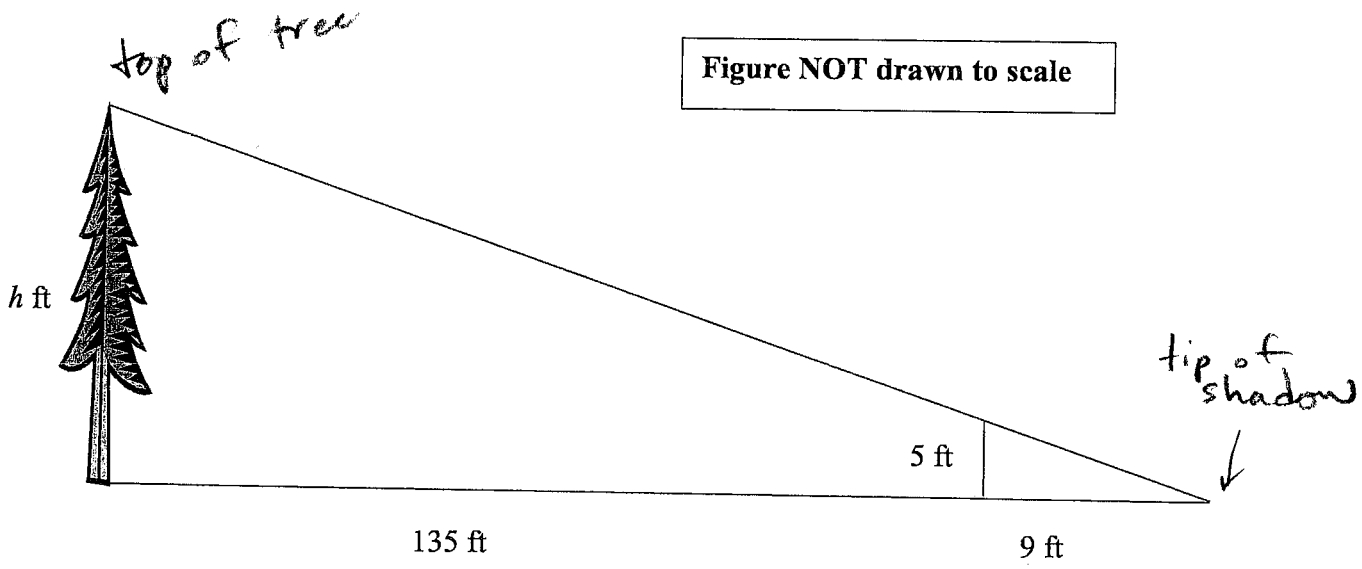
$$\frac{IJ}{DE} = \frac{GH}{BC} = \frac{12}{10} = \frac{6}{5}$$

$$\frac{y+1.5}{y} = \frac{6}{5}$$

$$5y + 7.5 = 6y$$

$$7.5 = y$$

51. Jack wishes to find the height of a tree. He puts a stick into the ground and uses the sun's shadow to take some measurements. The figure below shows his measurements.



a. Determine the height of the tree.

$$\frac{5}{9} = \frac{h}{135+9}$$

$$h = \frac{5(144)}{9} = 80 \text{ ft}$$

skip b. Determine the distance from the tip of the sun's shadow to the top of the tree.

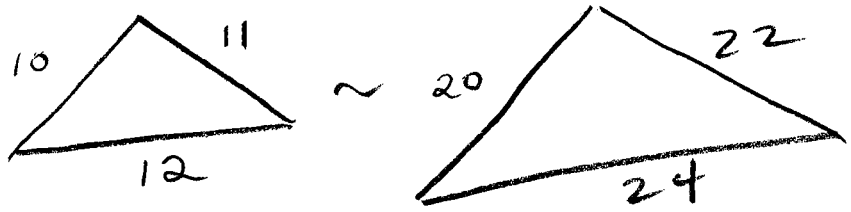
Chapter 9

$$\sqrt{h^2 + (135+9)^2}$$

$$\sqrt{80^2 + 144^2} = 16\sqrt{106}$$

52. Draw examples of two triangles that are similar by each similarity postulate/theorem.

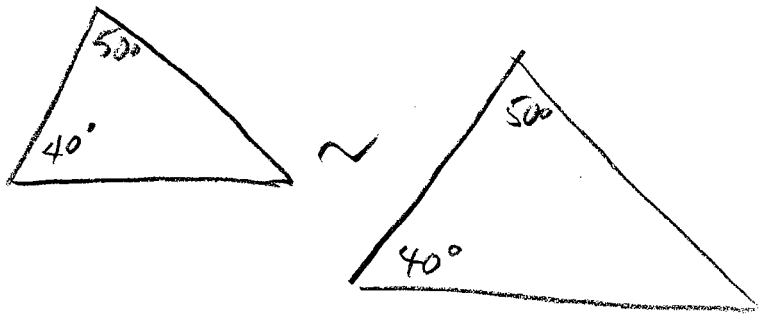
a. Draw examples of two triangles that are similar by SSS Similarity.



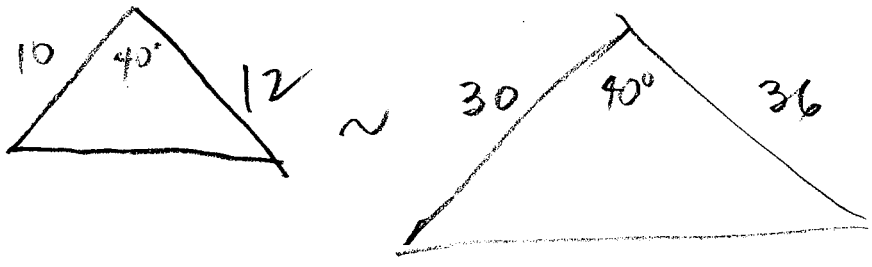
$\frac{10}{20} = \frac{11}{22} = \frac{12}{24} = \frac{1}{2}$

Corresponding sides are the same prop.

b. Draw examples of two triangles that are similar by AA Similarity.



C. Draw examples of two triangles that are similar by SAS Similarity.



Skip 53 – 63 (Chapter 9 Material)