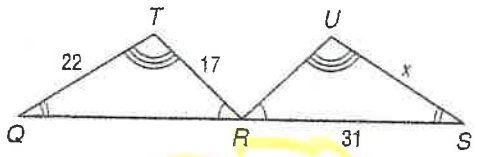
2.8 Congruent vs. Similar - Skeleton Notes

Congruent: having the same shape & size (equal)

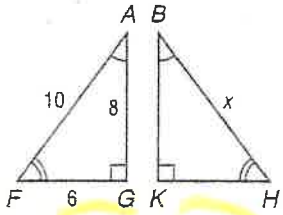
Find the value of x for each pair of congruent triangles.

① $\triangle TQR \cong \triangle USR$



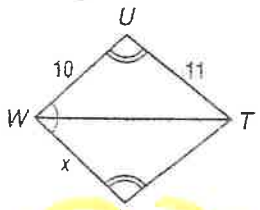
$x = 22$

② $\triangle AGF \cong \triangle BKH$



$x = 10$

③ $\triangle WUT \cong \triangle WVT$



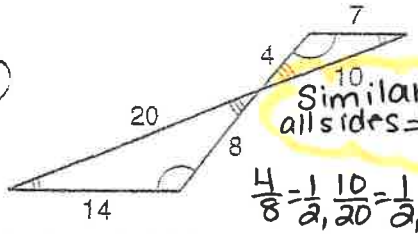
$x = 10$

Similar: (symbol "~")

- having the same shape, but different size
- shapes that are similar, have congruent corresponding angles
- shapes that are similar, have proportionate corresponding sides
- to figure out a missing side of two similar shapes, use ratios

Tell whether each pair of polygons is similar.

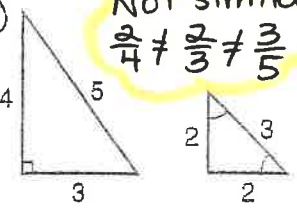
④



Similar, all sides = $\frac{1}{2}$

$\frac{4}{8} = \frac{1}{2}, \frac{10}{20} = \frac{1}{2}, \frac{7}{14} = \frac{1}{2}$

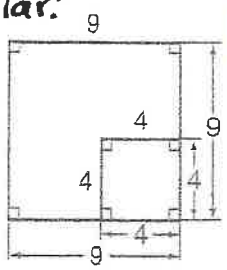
⑤



Not similar

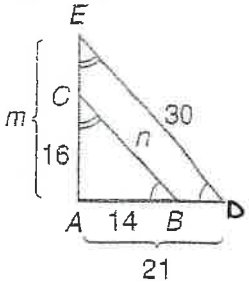
$\frac{2}{4} \neq \frac{2}{3} \neq \frac{3}{5}$

⑥



Similar, all sides = $\frac{4}{9}$

$\triangle ABC \sim \triangle ADE$. Use this information to answer Exercises 4-6.



⑦ List all pairs of corresponding angles.

$\angle E \cong \angle C$, $\angle B \cong \angle D$

⑧ Write a proportion and solve for m.

$\frac{16}{m} = \frac{14}{21}$

$16 \cdot 21 = 14 \cdot m$

$336 = 14m$

$24 = m$

⑨ Write a proportion and solve for n.

$\frac{n}{30} = \frac{14}{21}$

$30 \cdot 14 = 21n$

$420 = 21n$

$20 = n$

True or False:

- Two triangles that are similar must have the same size. FALSE
- Two triangles that are similar have the same shape. TRUE
- Two triangles that are similar have corresponding angles that are congruent. TRUE

* pg. 131 - Got it? #1

$$\frac{AB}{AC} = \frac{DE}{DF}$$

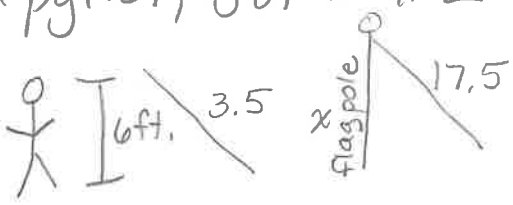
$$\frac{10}{x} = \frac{7.5}{18}$$

$$10(18) = 7.5(x)$$

$$\frac{180 = 7.5x}{7.5}$$

$x = 24$

* pg. 131, Got it #2



$$\frac{6}{3.5} = \frac{x}{17.5}$$

$$6(17.5) = 3.5x$$

$$\frac{105 = 3.5x}{3.5}$$

$x = 30$ ft.

* Scale drawing - a drawing that is similar to an actual object or place in which the ratio of any length on the drawing to the actual length is always the same

* pg. 132 - Got it? #3

(a) $\frac{1 \text{ in.}}{110 \text{ mi.}} = \frac{0.6 \text{ in}}{x}$

$$1x = 110(0.6)$$

$x = 66$ mi.

(b) $\frac{2 \text{ in.}}{250 \text{ mi.}} = \frac{1 \text{ in.}}{x}$

$$\frac{2x = 250}{2}$$

$x = 125$ mi.

1 inch = 125 mi.

pg. 133 - Got it? #4

$$\frac{1 \text{ in}}{50 \text{ ft}} = \frac{6 \text{ in}}{x}$$

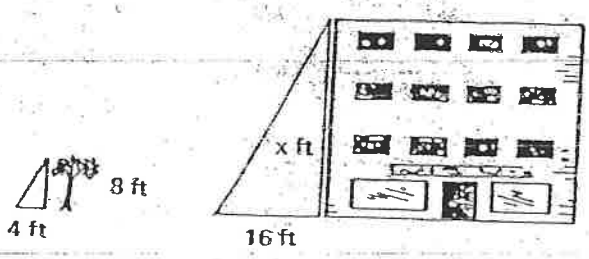
$$1x = 50(6)$$

$x = 300$ ft

Problem Solving

Solve each problem. Work must be shown for credit.

1. A tree 8 feet high casts a 4-foot shadow. At the same time, a nearby building casts a 16-foot shadow. What is the height of the building?



The height of the building is _____ feet.

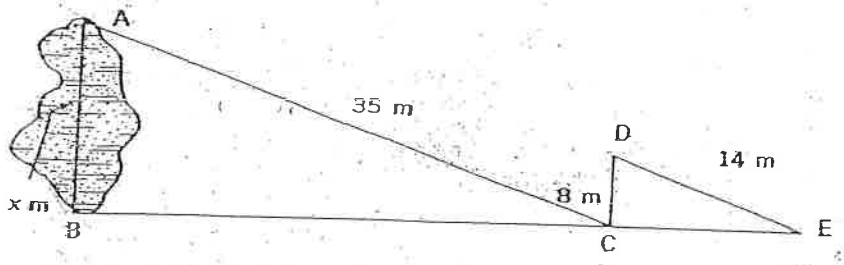
1.

$\frac{8}{4} = \frac{x}{16}$

$128 = 4x$

$x = 32$ ft

2. If $\triangle CAB \sim \triangle EDC$, what is the length of the pond shown below?



The length of the pond is _____ meters.

2.

$\frac{x}{8} = \frac{35}{4}$

$280 = 14x$

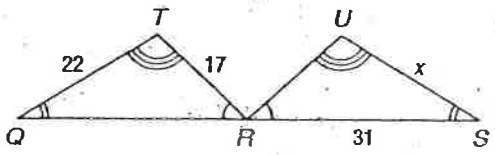
$x = 20$ m

Section 2-8 **Congruent vs. Similar** - Skeleton Notes

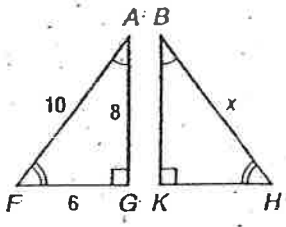
Congruent: _____

Find the value of x for each pair of congruent triangles.

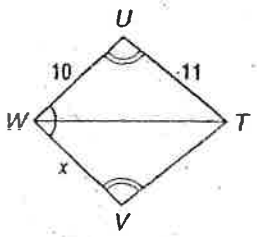
① $\triangle TQR \cong \triangle USR$



② $\triangle AGF \cong \triangle BKH$



③ $\triangle WUT \cong \triangle WV$



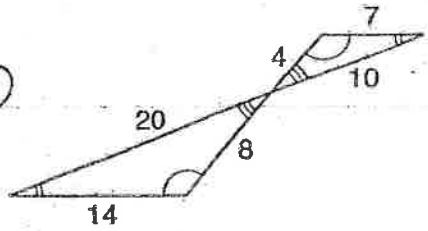
_____

Similar:

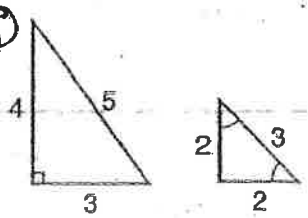
- having the same shape, _____
- shapes that are similar, _____
- shapes that are similar, _____
- to figure out a missing side of two similar shapes, _____

Tell whether each pair of polygons is similar.

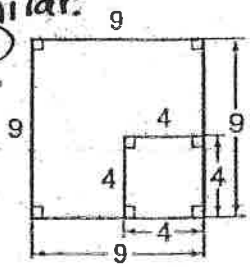
④



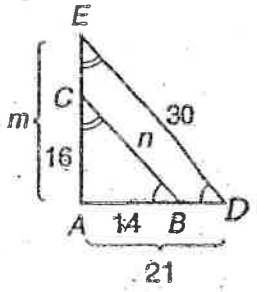
⑤



⑥



$\triangle ABC \sim \triangle ADE$. Use this information to answer Exercises 4–6.



⑦ List all pairs of corresponding angles.

⑧ Write a proportion and solve for m.

⑨ Write a proportion and solve for n.

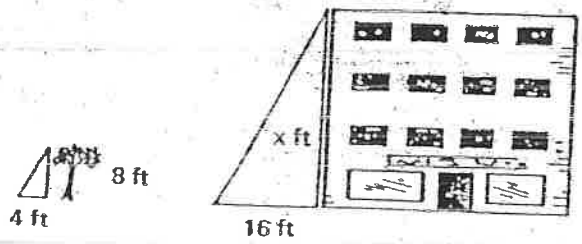
True or False:

- Two triangles that are similar must have the same size.
- Two triangles that are similar have the same shape.
- Two triangles that are similar have corresponding angles that are congruent.
- All right triangles are similar.

Problem Solving

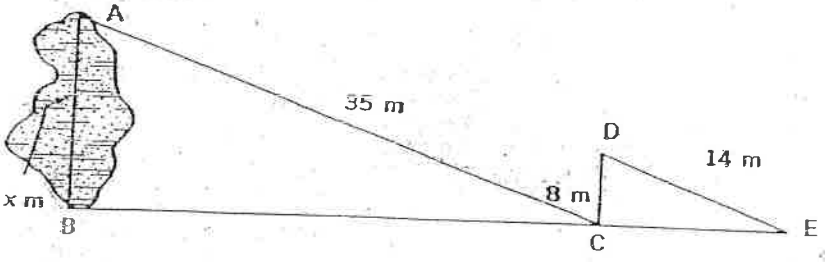
Solve each problem. Work must be shown for credit.

1. A tree 8 feet high casts a 4-foot shadow. At the same time, a nearby building casts a 16-foot shadow. What is the height of the building?



The height of the building is _____ feet.

2. If $\triangle CAB \sim \triangle EDC$, what is the length of the pond shown below?



The length of the pond is _____ meters.

1.

2.

2.8 pg. 134 #6-16 even #17-23 all

(6) $\angle A \cong \angle D$
$\angle B \cong \angle E$
$\angle C \cong \angle F$

$\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF}$

(8) $\frac{7.5}{5} = \frac{18}{x}$

$7.5x = 18(5)$
$7.5x = 90$
$x = 12$

(10) $\frac{28}{42} = \frac{35}{z}$

$28z = 42(35)$
$28z = 1470$
$z = 52.5$

(12) $\frac{20}{x} = \frac{50}{120}$

$20(120) = 50x$
$2400 = 50x$
$x = 48$ yd

(14) $\frac{1\text{ cm}}{15\text{ km}} = \frac{0.2\text{ cm}}{x\text{ km}}$

$1x = 15(0.2)$
$x = 3$ km

(16) $\frac{1\text{ cm}}{15\text{ km}} = \frac{4.6\text{ cm}}{x\text{ km}}$

$1x = 15(4.6)$
$x = 69$ km

(17) $\frac{0.2\text{ in}}{27\text{ ft}} = \frac{0.5\text{ in}}{x\text{ ft}}$

$0.2x = 27(0.5)$
$0.2x = 13.5$
$x = 67.5$ ft

(18) $\frac{1\text{ in.}}{x} = \frac{2.5\text{ in.}}{175\text{ mi.}}$ 1 in : 70 mi.

$175 = 2.5x$

$x = 70$ mi.

(19) width $= (12 \cdot 2.5) = 30$ inches or 2 1/2 feet
length $= (12 \cdot 6.5) = 78$ inches or 6 1/2 feet

(20) 20 ft × 10 feet
(240 in. × 120 in)

(21) No, it would not fit b/t the closet & dryer/washer

(22) $\frac{1}{144} = \frac{x}{168}$

$144x = 168$

about $x = 1$ 1/6 ft

(23) @ the proportion should be $\frac{BC}{AJ} = \frac{GH}{FN}$ ← correct denominator

(b) $\frac{BC}{AJ} = \frac{GH}{FN}$ $\frac{65}{14} = \frac{32.5}{x}$ $65x = 455$ $x = 7$