

# Similarities – Similar Triangles

Homework Section 7.3

Name \_\_\_\_\_

#1) Write down the definition of similar polygons.

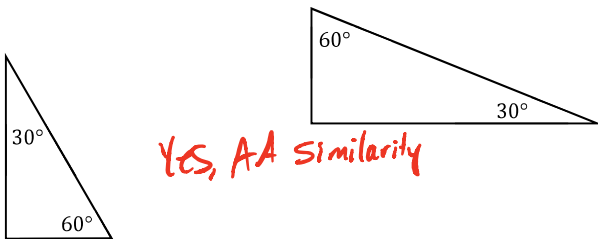
Two polygons are similar if corresponding angles are congruent and corresponding sides are proportional.

#2) Write down the definition of congruent polygons.

Two polygons are congruent if corresponding angles and corresponding sides are congruent.

Determine whether each pair of triangles is similar using the given information. If similar, explain.

#3)



#4)

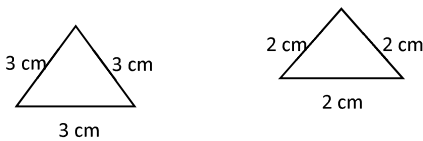


$$\frac{10.5}{7} = \frac{12}{8} \neq \frac{16.5}{12}$$

$$1.5 = 1.5 \neq 1.375$$

NO, corresponding sides are not proportional.

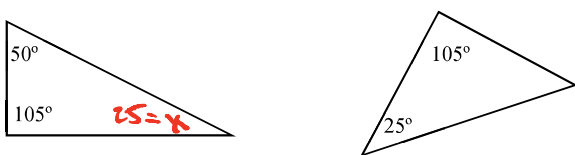
#5)



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

Yes corresponding sides are proportional.

#6)

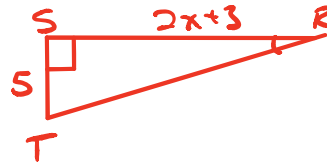
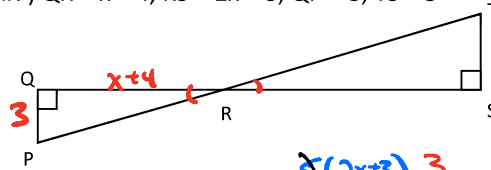


$$\begin{aligned} 50 + 105 + x &= 180 \\ 155 + x &= 180 \\ x &= 25 \end{aligned}$$

YES, AA Similarity

Find the value of x.

#7)  $QR = x + 4$ ,  $RS = 2x + 3$ ,  $QP = 3$ ,  $TS = 5$



$$\frac{3}{5} = \frac{x+4}{2x+3}$$

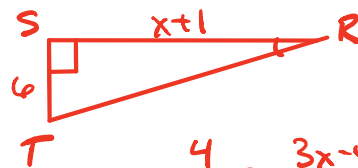
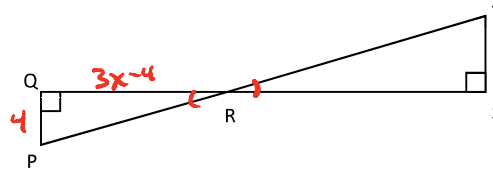
$$3(2x+3) = 5(x+4)$$

$$6x + 9 = 5x + 20$$

$$x + 9 = 20$$

$$x = 11$$

#8)  $QR = 3x - 4$ ,  $RS = x + 1$ ,  $QP = 4$ ,  $TS = 6$



$$\frac{4}{6} = \frac{3x-4}{x+1}$$

$$\frac{2}{3} = \frac{3x-4}{x+1}$$

$$2(x+1) = 3(3x-4)$$

$$2x+2 = 9x-12$$

$$2 = 7x-12$$

$$14 = 7x$$

$$2 = x$$

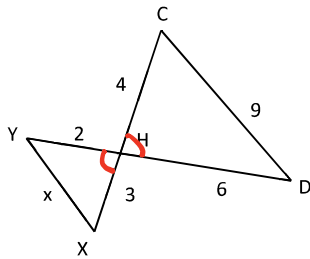
# Similarities – Similar Triangles

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Determine if each pair of triangles is similar. If similar, state the reason and find the missing measures.

#9)



$$\frac{2}{4} = \frac{3}{6}$$

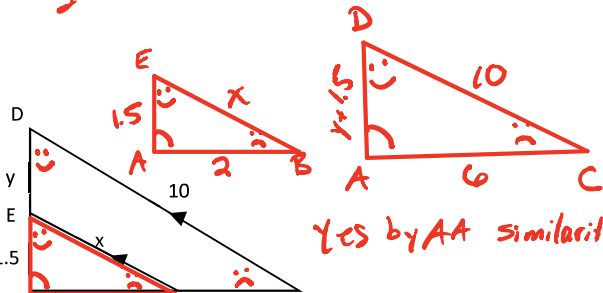
Yes by SAS similarity

$$\frac{2}{4} = \frac{x}{9}$$

$$9 \cdot \frac{1}{2} = \frac{x}{1} \cdot 9$$

$$\frac{9}{2} = x$$

#10)



Yes by AA similarity.

$$\frac{1.5}{10} = \frac{2}{6}$$

$$\frac{1.5}{2} = \frac{10}{3} \cdot 10$$

$$x = \frac{10}{3}$$

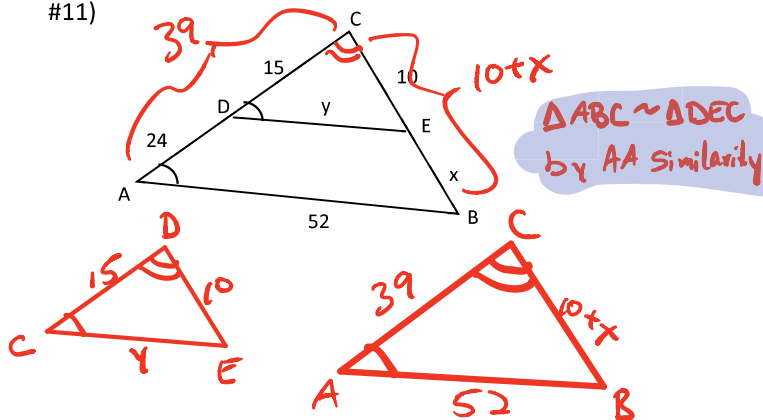
$$\frac{1.5}{4.5} = \frac{1}{3} \cdot 3(y+1.5)$$

$$4.5 = y + 1.5$$

$$3 = y$$

Identify the similar triangles in each figure. Explain why they are similar and find the missing measures of x and y.

#11)



$\triangle ABC \sim \triangle DEC$   
by AA similarity

$$\frac{15}{39} = \frac{10}{10+x}$$

$$\frac{5}{13} = \frac{10}{10+x}$$

$$5(10+x) = 10 \cdot 13$$

$$50 + 5x = 130$$

$$5x = 80$$

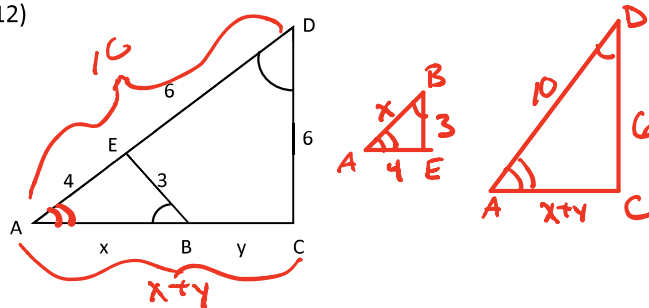
$$x = 16$$

$$\frac{5}{18} = \frac{y}{52}$$

$$4.5 = y$$

$$20 = y$$

#12)



$\triangle ABE \sim \triangle ADC$  by AA similarity

$$\frac{x}{10} = \frac{3}{6}$$

$$\frac{1}{2} = \frac{4}{5+y}$$

$$\frac{x}{10} = \frac{1}{2} \cdot 10$$

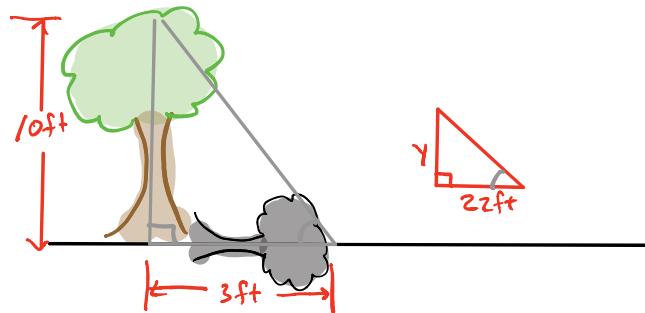
$$5+y = 8$$

$$x = 5$$

$$y = 3$$

Draw a picture, make a proportion and answer the question.

#13) A 10 foot tree casts a 3 foot shadow. How tall is a tree that casts a 22 foot shadow at the same time of day? Round to one decimal place.



$$\frac{10}{3} = \frac{y}{22}$$

$$220 = 3y$$

$$\frac{220}{3} = y$$

$$73.3 \text{ ft} \approx y$$

The shadow is about 73.3 feet.

#3) Yes by AA similarity

#4) No (corresponding sides are not proportional)

#5) Yes by SSS similarity #6) Yes by AA similarity

#7)  $x = 11$  #8)  $x = 2$

#9) Yes, SAS similarity.  $x = 4.5$  or  $\frac{9}{2}$

#10) Yes, AA similarity.  $(\frac{10}{3}, 3)$

#11)  $\triangle ABC$  is similar to  $\triangle DEC$ , by AA Similarity, (16, 20)

#12)  $\triangle ABE$  is similar to  $\triangle ADC$ , by AA Similarity, (5, 3)

#13) 73.3'