

Chapter 7 – Similarity

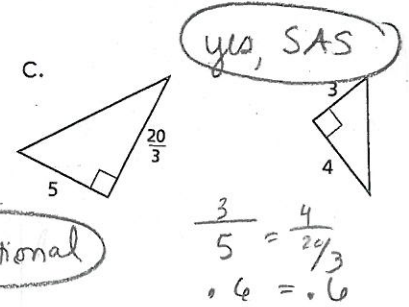
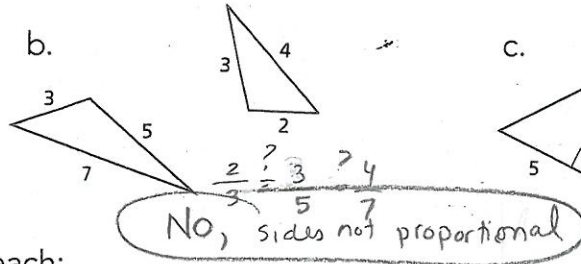
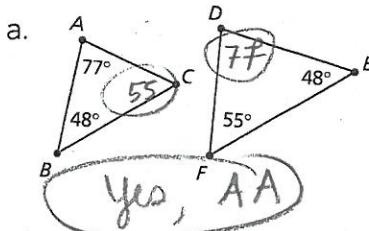
1. Solve the proportion: $\frac{3}{x+2} = \frac{4}{x}$

$3x = 4x + 8$
 $-x = 8$
 $x = -8$

2. Jonathon Swift wrote *Gulliver's Travels* in 1726. In the story, Gulliver is shipwrecked and wanders ashore the island of Lilliput. The average height of a Lilliputian is 6 inches tall. Use the scaled picture at right to estimate Gulliver's height.



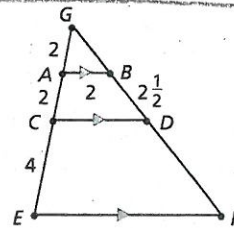
3.. Are the 2 triangles similar? If Yes, state your reason.



4. Use the image at right to solve for each:

a. $EF = 8$ $\frac{2}{2} = \frac{8}{x}$

b. $DF = 5$ $\frac{2}{4} = \frac{2.5}{x}$



5. To find the height of Abraham Lincoln as he sits in the Lincoln Memorial, you place a mirror on the ground and stand where you can see the top of the statue reflected in the mirror. A few security guards approach you, but you assure them these are simply tools of math instruction. Your eyes are 5'8" high and you are standing 1.5 ft. from mirror. If the mirror is 5 ft. from the base of the statue, how tall is President Lincoln as he sits in the memorial?



$\frac{68}{18} = \frac{x}{60}$
 $200 \text{ in} = x$

18.89 ft or 226.67 in.

6. Find the scale factor for image at right.

$\frac{3}{1}$

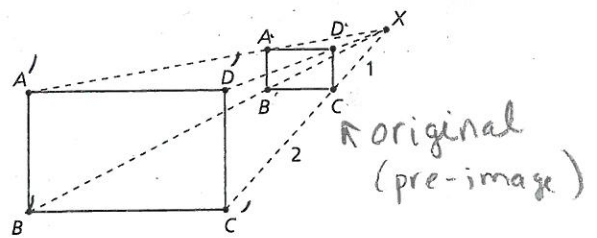
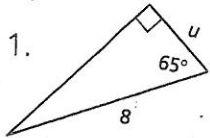


image is larger (s.f. over 1)

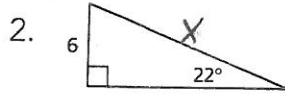
Chapter 8 - Trigonometry

#1-3, Solve for the labeled part of triangle.



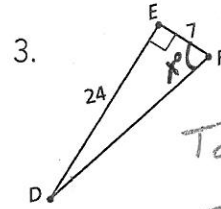
$$\cos 65 = \frac{u}{8}$$

$$3.38$$



$$\sin 22 = \frac{6}{X}$$

$$16.02$$



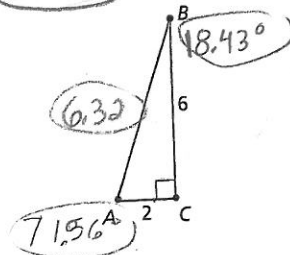
$$\tan X = \frac{24}{7}$$

$$73.74^\circ$$

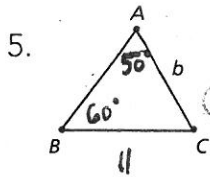
4. Solve the triangle at right.

$$6^2 + 2^2 = x^2$$

$$6.32 = x$$

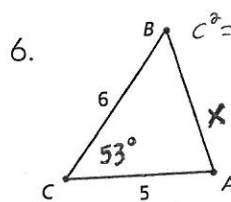


#5-7, Solve for the labeled part of these triangles (notice they are not right triangle?)



$$b = 12.43$$

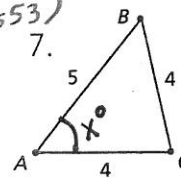
$$\frac{\sin 50}{11} = \frac{\sin 60}{b}$$



$$c^2 = 5^2 + 6^2 - (2 \cdot 5 \cdot 6 \cdot \cos 53)$$

$$c^2 = 24.89$$

$$c = 4.99$$



$$4^2 = 5^2 + 4^2 - (2 \cdot 4 \cdot 5 \cdot \cos X)$$

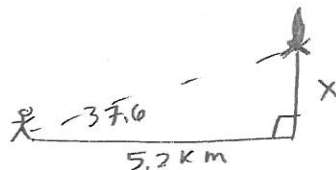
$$16 = 25 + 16 - (40 \cos X)$$

$$-25 = -40 \cos X$$

$$0.625 = \cos X$$

$$51.32^\circ = X$$

8. An observer 5.2 km. from a missile launch pad views the missile ascending. At one moment she determines the missile is 37.6° above the horizon. What is the elevation of the missile at the moment?



$$\tan 37.6 = \frac{x}{5.2}$$

$$4 \text{ km}$$

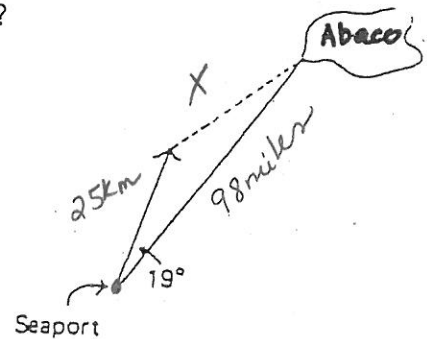
9. Christopher left Seaport in his yacht for Abaco Island (98 km away) before the fog had lifted. 25 km out to sea he noticed he was 19° off course. He corrected his course and noticed he had enough fuel to go another 77 km. Will he make it to Abaco Island?

$$x^2 = 25^2 + 98^2 - (2 \cdot 25 \cdot 98 \cdot \cos 19)$$

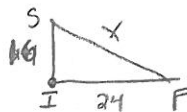
$$x^2 = 5595.96$$

$$x = 74.81 \text{ miles}$$

Christopher can make it



10. Summerton is 16 miles due north of where I stand. Funville is 24 miles due east of where I stand. How far apart are the two towns? (as the crow flies)



$$16^2 + 24^2 = x^2$$

$$28.84 \text{ mi. apart}$$