NAME:_____
Period:_____ Date:_____

Similarity

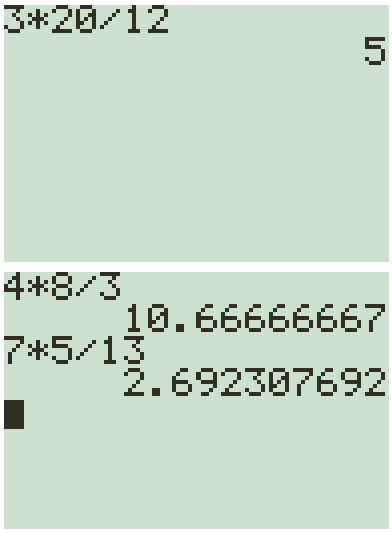
Solve these proportions.

_____1. $\frac{x}{7} = \frac{5}{9}$

_____2. $\frac{3}{x} = \frac{12}{20}$

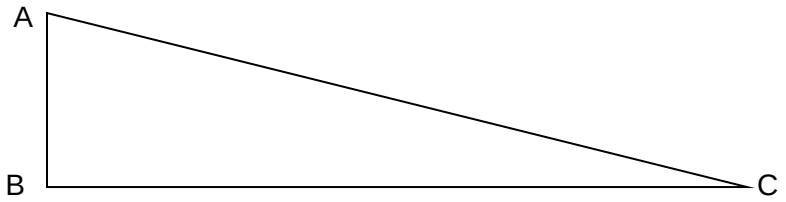
_____3. $\frac{4}{3} = \frac{x}{8}$

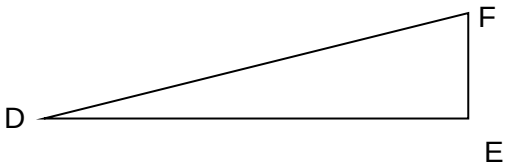
_____4. $\frac{13}{7} = \frac{5}{x}$



REMEMBER: When you cross-multiply, the number you DIVIDE by is diagonally across from "x".

Use these similar figures for the problems below.





$\angle F$_____5. What angle has the same measure as ∠A?

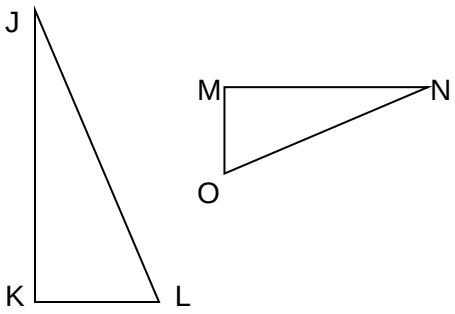
$\angle C$_____6. What angle has the same measure as ∠D?

$\angle B$_____ and $\angle E$_____7. What other pair of angles have the same measure?

B_____8. REMEMBER: When you say triangles are similar, you must list the corresponding angles in order. Which of these statements would be correct for the figures above?

A. △ABC ~ △DEF
B. △ABC ~ △FED
C. △ABC ~ △DFE
D. △ABC ~ △EDF

$\Delta JKL \sim \Delta NMO$ _____ 9. Write a statement that says that the triangles at right are similar. (Be sure to list the angles in the correct order.)



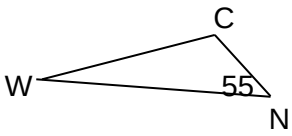
90 _____ 10. If ∠K measures 90°, how big is ∠M?

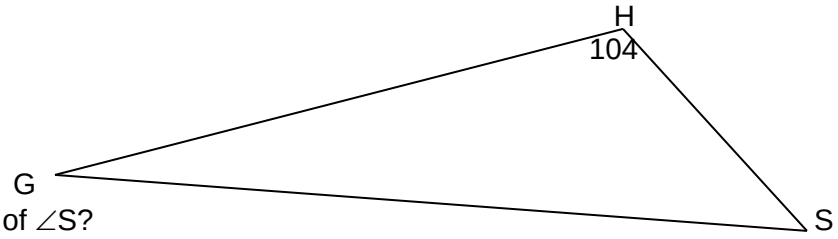
$\angle J$ _____ 11. If ∠N measures 20°, what other angle measures 20°?

_____ 12. Use the information in Problems 10 and 11 to find the measure of ∠O.

180−90−20
70

$\angle L$ _____ 13. What other angle has the same measure as ∠O?





55 _____ 14. What is the measure of ∠S?

104 _____ 15. What is the measure of ∠C?

_____ 16. What is the measure of ∠W? _____ 17. What is the measure of ∠G?

180−55−104
21

Both $\angle W$ and $\angle G$ are 21 degrees.

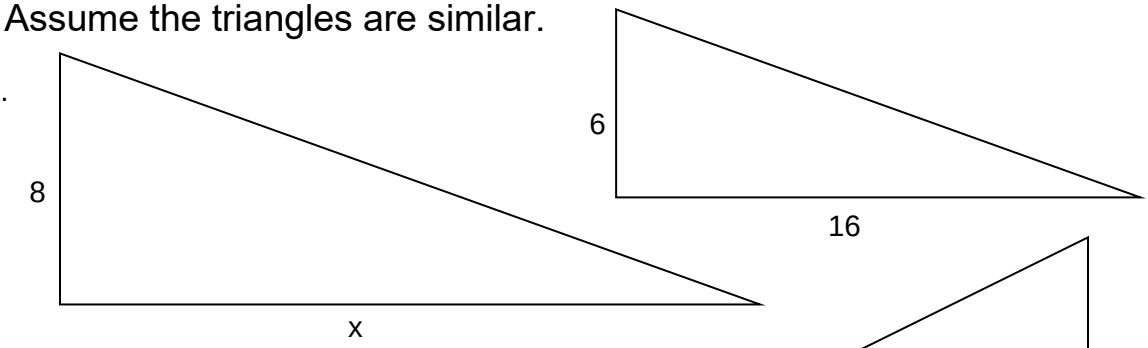
$\Delta WCN \sim \Delta GHS$ _____ 18. Write a statement that says that the triangles are similar. (Be sure to list the angles in the correct order.)

There are 6 possible answers you could write.
The important part is that you match up the angles that go together.

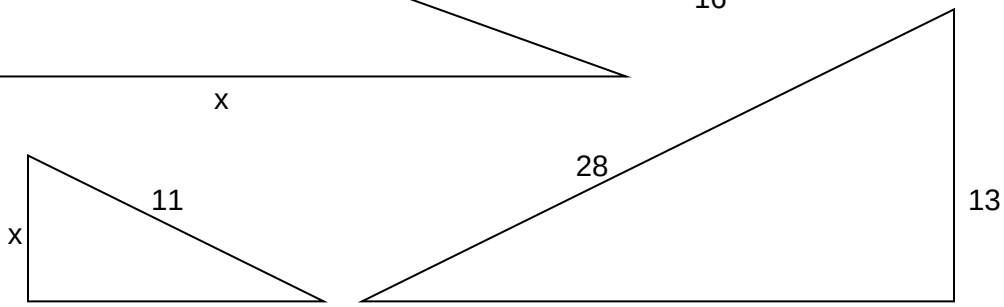
The answers to the next section follow the section.

Solve for "x". Assume the triangles are similar.

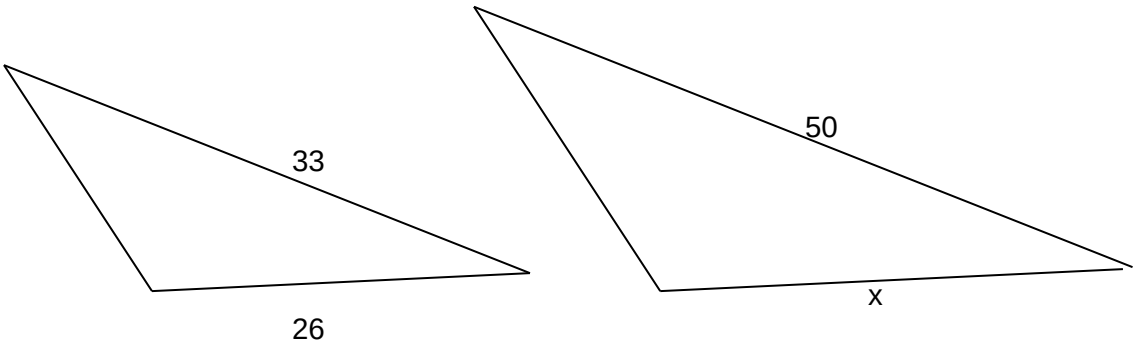
_____19.



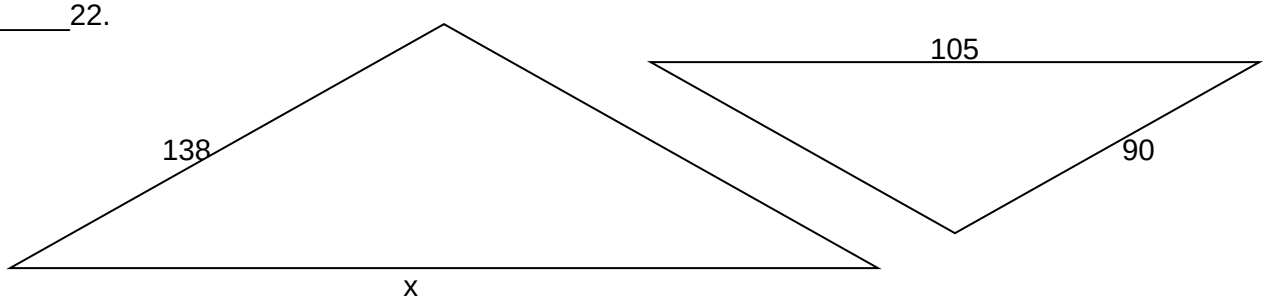
_____20.



_____21.



_____22.



19. $\frac{8}{6} = \frac{x}{16}$

20. $\frac{x}{13} = \frac{11}{28}$

```
16*8/6
        21.33333333
13*11/28
        5.107142857
```

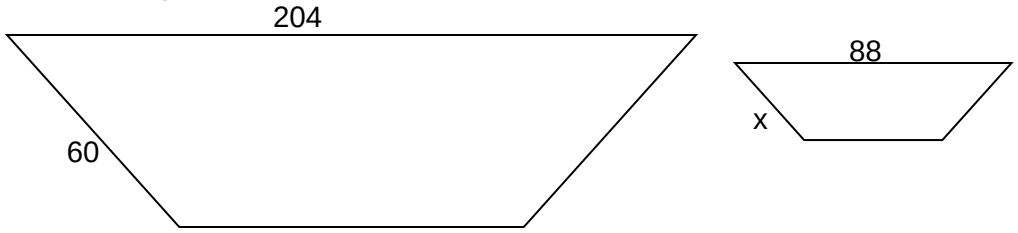
21. $\frac{33}{50} = \frac{26}{x}$

22. $\frac{138}{90} = \frac{X}{105}$

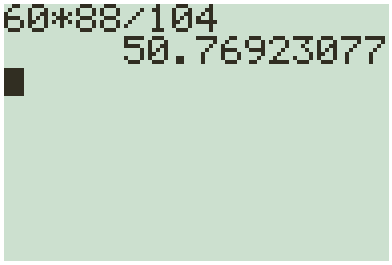
```
50*26/33
        39.39393939
138*105/90
                 161
```

Solve for “x”. Assume the figures are similar.

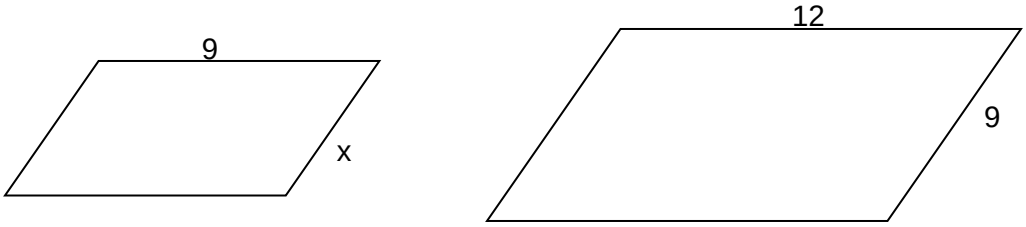
_____23.



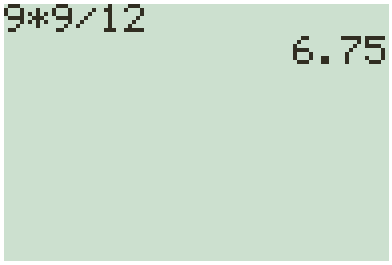
$\frac{60}{x} = \frac{104}{88}$



_____24.



$\frac{9}{12} = \frac{x}{9}$



The answers to the next section follow the section.

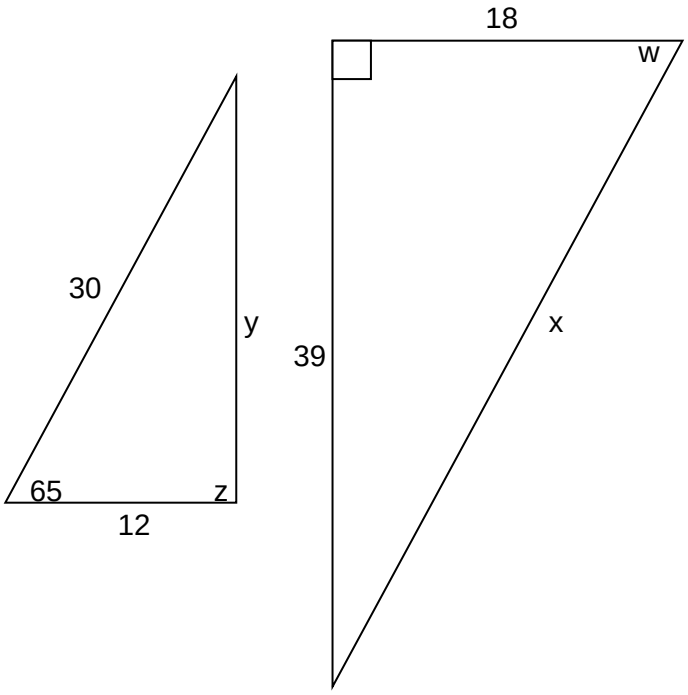
Use the triangles at right for the problems below.

_____25. Find x.

_____26. Find y.

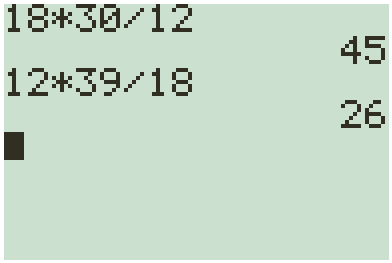
_____27. Find z.

_____28. Find w.



25. $\frac{12}{18} = \frac{30}{x}$

26. $\frac{12}{18} = \frac{y}{39}$



27. 90

28. 65

Corresponding angles are ≅

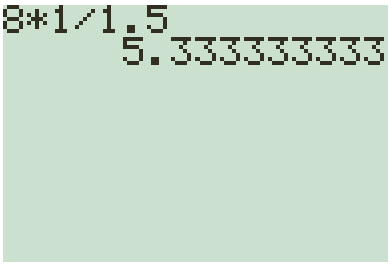
For the problems below:

A. Write a proportion.

B. Solve.

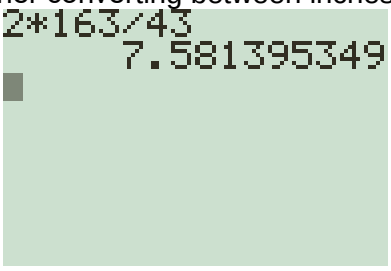
_____29. A Pepsi bottle stands 8 inches tall. The diameter of the bottom is 1½ inches. A similar Pepsi bottle has a bottom diameter of 1 inch. How tall is it?

$\frac{8}{1.5} = \frac{x}{1}$



_____30. On a map the distance from Algona to Ft. Dodge is 2 inches. The distance in real life is 43 miles. Keokuk and Waterloo are 163 miles apart. How far apart would they be on the map? (NOTE: You don't need to bother converting between inches and miles.)

$\frac{2}{43} = \frac{x}{163}$

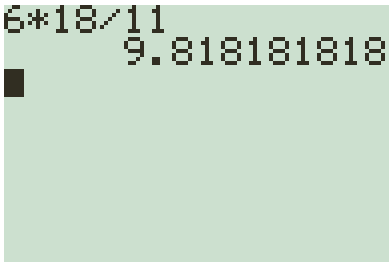


NOTE: On all of these problems, there are multiple ways you could set up the proportion. The important thing is that both across and up/down the numbers have something to do with each other. In $\frac{2}{43} = \frac{x}{163}$, both 2 and 43 deal with Ft. Dodge (up/down match up) and both 43 and 163 are real-life distances (across matches up). Another correct way to write the proportion would be $\frac{2}{x} = \frac{43}{163}$. As long as you set up things in any correct proportion, the final answer should be about 7.6 inches.

_____31. The euro bills they use in Europe get bigger the more money is worth, and all the bills are similar. A €5 bill measures 11cm long and 6cm wide. The €500 bill is 18cm wide. How tall is it?

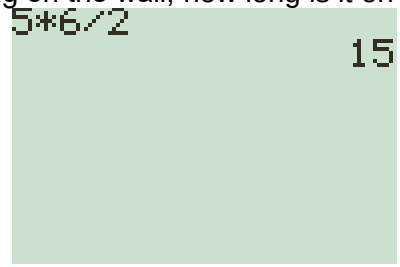
NOTE: This problem is worded awkwardly. It should have used "long" and "wide" or "wide" and "tall" consistently. In reality the shorter dimension of the €5 note is 6, and the longer dimension is 11. For the €500 note, the <u>longer</u> dimension is 18. What you need to find is the shorter dimension (which isn't really clear the way it's written). So you want to match up long with long and short with short.

$\frac{11}{6} = \frac{18}{x}$



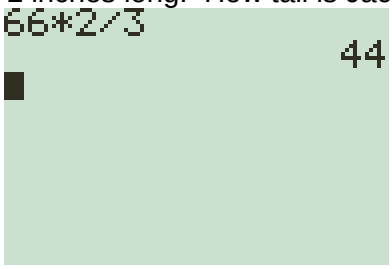
_____32. When Mr. Burrow writes the letter "F" on an overhead projector, the top of the letter is exactly 5mm long. When the "F" is projected on the wall, the top of the letter is 2 inches wide. If the side of the "F" is 6 inches long on the wall, how long is it on the projector?

$\frac{5mm}{2in} = \frac{Xmm}{6in}$



_____33. Pierre is 66 inches tall. His nose is 3 inches long. His body is similar in shape to his little brother Jacques, whose nose is only 2 inches long. How tall is Jacques?

$\frac{66}{3} = \frac{x}{2}$



_____34. Boris is hiking in Siberia, when he suddenly comes face to face with the abominable snowman. Boris is 5 feet tall, and his shadow is 4 feet long. If the snowman's shadow is 20 feet long, how tall is the abominable snowman?

$\frac{5}{4} = \frac{x}{20}$

_____35. A six-foot tall Christmas tree measures 4½ feet wide across the bottom. How wide at the bottom would an 8½ foot tall Christmas tree be?

$\frac{6}{4.5} = \frac{8.5}{x}$