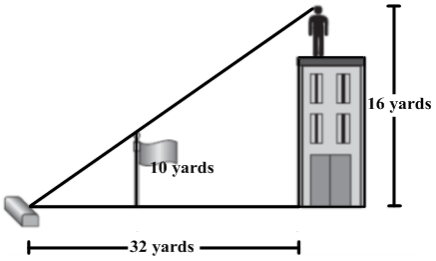
Name: _____

Semester 2 Final Review I
Triangle Sum and Similarity

Example:
Robert looks from a height of 16 yards at the top of his apartment building. He lines up the top of a flagpole with the curb of a street 32 yards from the apartment building. If the flagpole is 10 yards tall, how far from the apartment building is the flagpole?

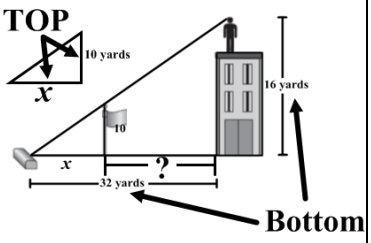


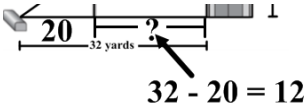
Be careful! The question doesn't ask for the bottom of the small triangle. It asks for the space between the building and the pole!

The two triangles in the picture are similar, so I must create fractions.

$$\frac{x}{32} = \frac{10}{16}$$

$$16(x) = 32(10)$$
$$16x = 320$$
$$\div 16 \quad \div 16$$
$$x = 20$$

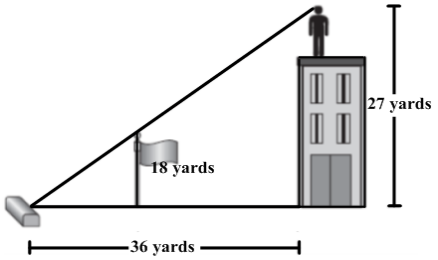




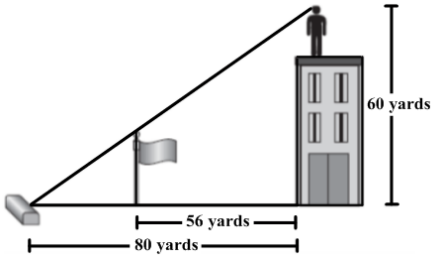
32 - 20 = 12

12 yards

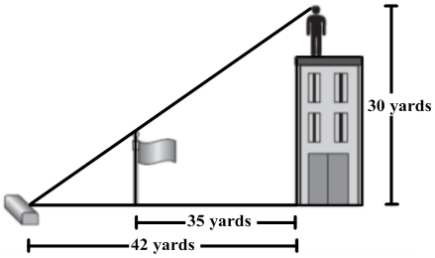
1. Kara looks from a height of 27 yards at the top of her apartment building. She lines up the top of a flagpole with the curb of a street 36 yards from the apartment building. If the flagpole is 18 yards tall, how far from the apartment building is the flagpole?



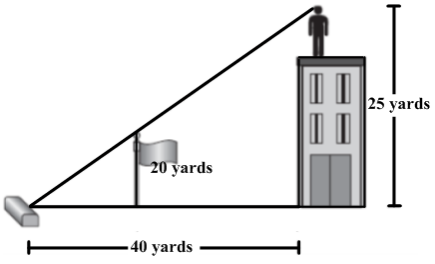
2. Oscar looks from a height of 60 yards at the top of his apartment building. He lines up the top of a flagpole with the curb of a street 80 yards from the apartment building. If the flagpole is 56 yards from the apartment building, how tall is the flagpole?



3. Jasmin looks from a height of 30 yards at the top of her apartment building. She lines up the top of a flagpole with the curb of a street 42 yards from the apartment building. If the flagpole is 35 yards from the apartment building, how tall is the flagpole?

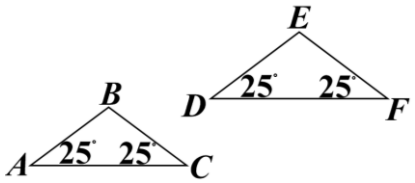


4. Aisha looks from a height of 25 yards at the top of her apartment building. She lines up the top of a flagpole with the curb of a street 40 yards from the apartment building. If the flagpole is 20 yards tall, how far from the apartment building is the flagpole?



Name: _____

Example:



Note: Drawings are not necessarily to scale.

Can we prove the two triangles above similar?

~~A. Yes, because all isosceles triangles are similar.~~
Being isosceles just means that at least two of the angles (and therefore two of the sides) on a triangle have the same value. It has <u>nothing</u> to do with a triangle's relationship to a different triangle.

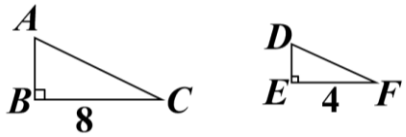
B. Yes, because the corresponding angles are congruent.
True. A and D are 25, C and F are 25. That makes two congruent angle sets, which is the property AA.

~~C. Yes, because the sides **look** proportional.~~
The phrase "looks like" will always be wrong. Nothing can be proven based off of how it "looks."

~~D. No, because we do not know whether $\angle B$ is congruent to $\angle E$.~~
Except, we <u>do know</u> that they are congruent. All triangles add to equal 180°, so if $\angle A$ & $\angle C$ are 25° & 25°, then $\angle B$ has to be 130°, just like $\angle E$ would have to be (since $\angle D$ and $\angle F$ are also 25° and 25°).

Properties that prove triangles are similar: SSS, SAS, AA

5.

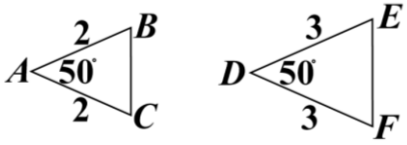


Note: Drawings are not necessarily to scale.

Can we prove the two triangles above similar?

A. Yes, because the sides are proportional.
B. Yes, because the angles look congruent.
C. No, because we do not know whether $\overline{AB}$ and $\overline{DE}$ are congruent.
D. No, because we do not know whether $\angle B$ and $\angle E$ are congruent.

6.

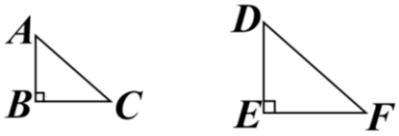


Note: Drawings are not necessarily to scale.

Can we prove the two triangles above similar?

A. Yes, because two sides are proportional and the included angles are congruent.
B. Yes, because all isosceles triangles are similar.
C. Yes, because the sides are proportional.
D. No, because the sides are not congruent.

7.

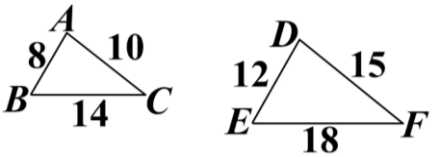


Note: Drawings are not necessarily to scale.

Can we prove the two triangles above similar?

A. Yes, because all right triangles are similar.
B. Yes, because the sides look proportional.
C. No, because $\angle A$ looks different than $\angle D$.
D. No, because we do not know if any other angle pairs are congruent.

8.



Note: Drawings are not necessarily to scale.

Can we prove the two triangles above similar?

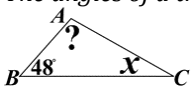
A. Yes, because the sides look proportional.
B. Yes, because the angles look congruent.
C. No, because the sides are not proportional.
D. No, because scalene triangles cannot be similar.

Name: _____

Example:
A ramp will be installed as modeled in the figure.

If $\angle C$ measures $x°$, what is the measure of $\angle A$?

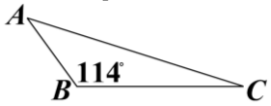
The angles of a triangle must add to equal 180°, & $m\angle C = x°$.



$$48 + x + m\angle A = 180$$
$$-48 \qquad\qquad -48$$
$$x + m\angle A = 132$$
$$-x \qquad\quad -x$$
$$m\angle A = 132 - x$$

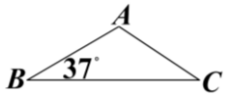
$\boxed{m\angle A = (132 - x)°}$

9. A ramp will be installed as modeled in the figure.



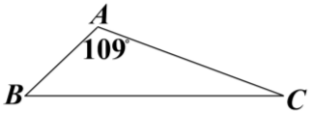
If $\angle C$ measures $x°$, what is the measure of $\angle A$?

10. A ramp will be installed as modeled in the figure.



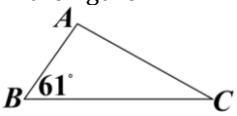
If $\angle C$ measures $x°$, what is the measure of $\angle A$?

11. A ramp will be installed as modeled in the figure.



If $\angle C$ measures $x°$, what is the measure of $\angle B$?

12. A ramp will be installed as modeled in the figure.



If $\angle C$ measures $x°$, what is the measure of $\angle A$?

Semester 2 Final Review I
Triangle Sum and Similarity Answers:

1. 12 yd	2. 18 yd	3. 5 yd	4. 8 yd
5. C	6. A	7. D	8. C
9. $(66 - x)°$	10. $(143 - x)°$	11. $(71 - x)°$	12. $(119 - x)°$