

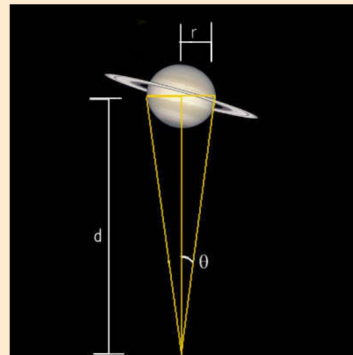
Please reflect for the week...

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>11/6</u> Topic: <u>Continued Coloring Links</u>	0 1 2	
Tuesday Date: <u>11/7</u> Topic: <u>Serpienski's triangle!</u>	0 1 2	
Wednesday Date: <u>11/8</u> Topic: <u>6B: Rational Equations</u>	0 1 2	
Thursday Date: <u>11/9</u> Topic: <u>20D: Similar Figures</u>	0 1 2	
Friday Date: <u>11/10</u> Topic: <u>Review of Similar Figures</u>	0 1 2	

Class Plan:

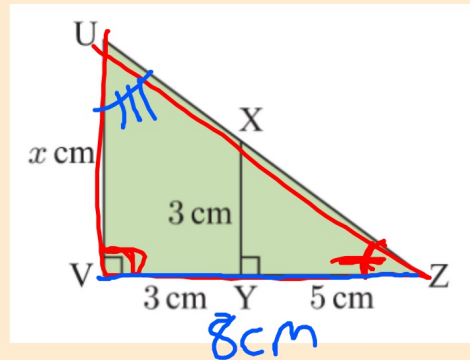
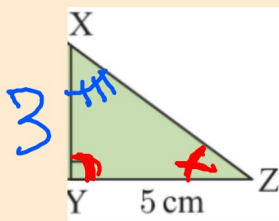
1. Warm-up
2. Introduction- Similar Triangles
3. Real-life Investigation - Camera
4. Joke Break!
5. Practice!

Today How do we measure something we cannot reach?



Introduction:

1) Are ΔUVZ and ΔXYZ similar?
Why or why not?



2) Find the value of x!

$$\boxed{x = 4.8 \text{ cm}} \quad \frac{5}{3} = \frac{8}{x} \quad \frac{5x}{5} = \frac{24}{5}$$

20E Indirect Measurement

Driving Question:

How can we use similar triangles and proportions, to find the height of objects beyond our reach (*indirect measurement*)?

Thinking Back...

Two figures are **similar** if:

- the figures are **equiangular** *and*
- the corresponding side lengths are in the **same ratio**.

E**Chapter 20****PROBLEM SOLVING**

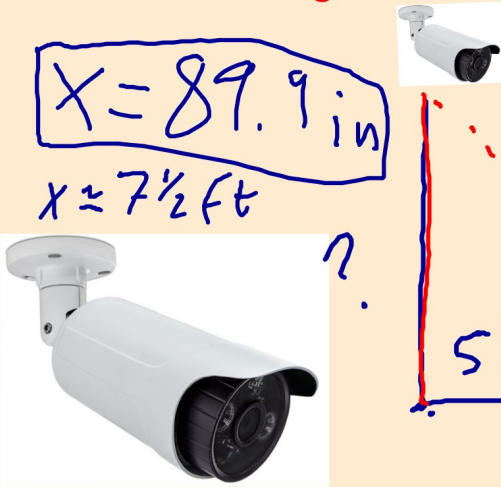
To solve problems involving similar triangles, we follow these steps:

- Step 1:* Sketch the situation, showing all of the given information.
- Step 2:* Use a variable such as x to represent the unknown quantity to be found.
- Step 3:* Establish that a pair of triangles are similar, and hence set up an equation involving the variable.
- Step 4:* Solve the equation.
- Step 5:* Answer the question in a sentence.

Investigation (2nd hour discovery!)

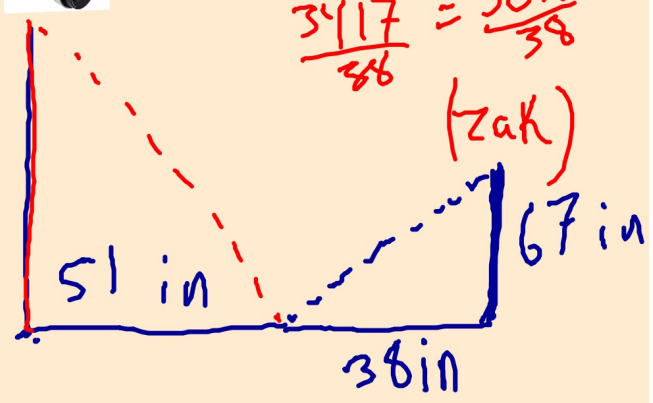
Southwest recently installed high-tech cameras in every room. By placing a **mirror** on the floor and adjusting where we stand, we can figure out the height of the camera!

What is the height of the camera?



$$X = 89.9 \text{ in}$$
$$x \approx 7\frac{1}{2} \text{ ft}$$

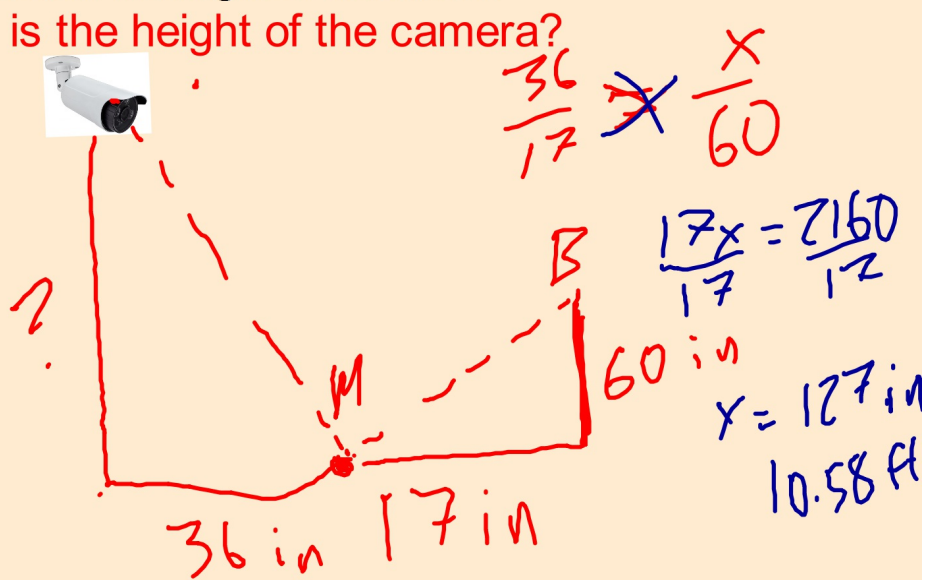
$$\begin{array}{r} 2 \quad 51 \\ \cdot \quad \times \\ \hline 67 \quad 38 \end{array}$$
$$67(51) = 38x$$
$$\frac{3417}{38} = \frac{38x}{38}$$



Investigation (4th hour discovery!)

Southwest recently installed high-tech cameras in every room. By placing a **mirror** on the floor and adjusting where we stand, we can figure out the height of the camera!

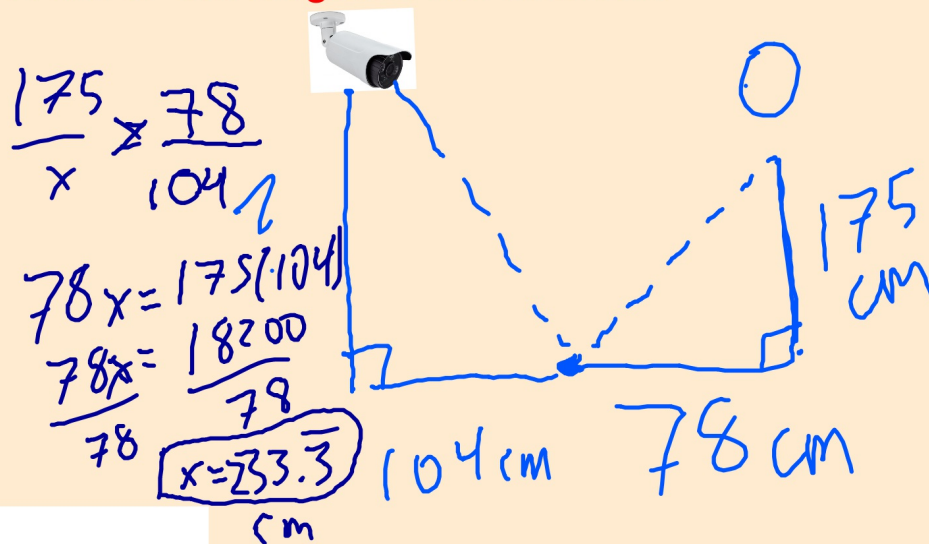
What is the height of the camera?



Investigation (7th hour discovery!)

Southwest recently installed high-tech cameras in every room. By placing a **mirror** on the floor and adjusting where we stand, we can figure out the height of the camera!

What is the height of the camera?



Investigation

2) Due to budget cuts, the cameras can only record clear images up to **6 feet away**. Based on the height of the camera, will it be able to record any student activity? Why or why not?



Joke Break!



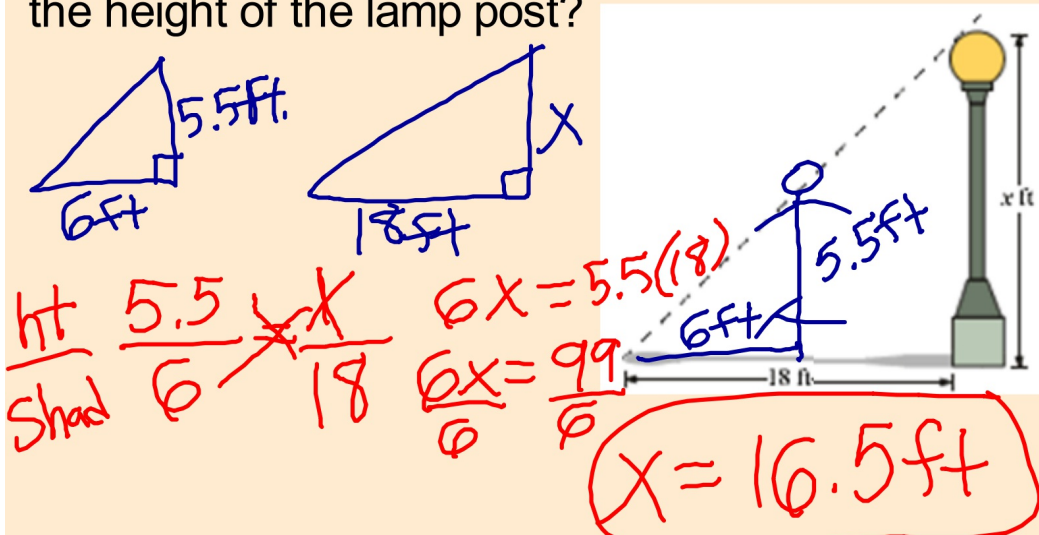
They thought it was
a camera



(it's not a camera)

Example #1

At a certain time of a day, a 5.5 feet tall woman casts a 6 foot shadow. At the same time of day, a lamp post casts an 18 foot shadow. What is the height of the lamp post?



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$$\frac{5.5 \text{ ft}}{6 \text{ ft}} = \frac{x}{18 \text{ ft}}$$

$$16.5 \text{ ft} = x$$

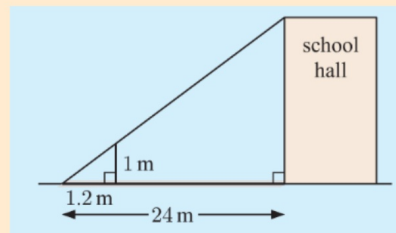


(Go through if time... solution in textbook)

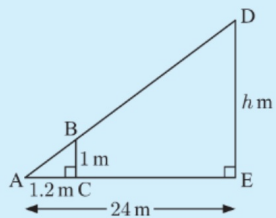
Example #2

One sunny morning, Rosie and Mohamed compare the length of the shadow of their school hall with that of a 1 metre ruler. Their measurements are shown in the diagram.

What is the height of the school hall?



Textbook Solution



Let the height of the hall be h m.

\triangle s ABC and ADE are equiangular as:

- $\widehat{ACB} = \widehat{AED} = 90^\circ$
- \widehat{A} is common to both triangles

\therefore \triangle s ABC and ADE are similar.

Corresponding sides must be in the same ratio.

$$\therefore \frac{DE}{BC} = \frac{AE}{AC}$$

$$\therefore \frac{h}{1} = \frac{24}{1.2}$$

$$\therefore h = 20$$

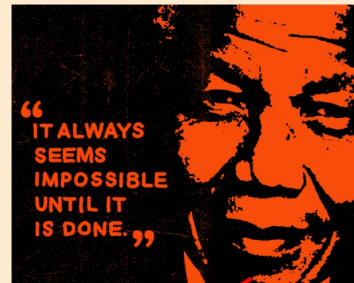
So, the hall is 20 m high.

Exercises: Finish 20E applications

20E pg. 403 # 2, 3, 4, 5, 8

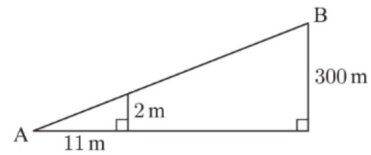
#5 and #8 are challenge!

$$\frac{x}{5.5} = \frac{18}{6} \quad \frac{5.5}{6} =$$

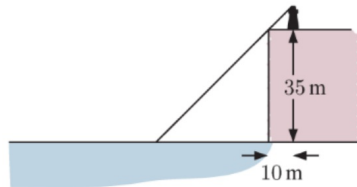


20E pg. 403 # 2, 3, 4, 5, 8

- 2 A road has a constant slope of 2 in 11. This means that if you travel 11 m horizontally along the road, you will rise 2 m.
- Over what horizontal distance will the road rise 300 m?
 - What is the length of the road [AB] to the nearest metre?



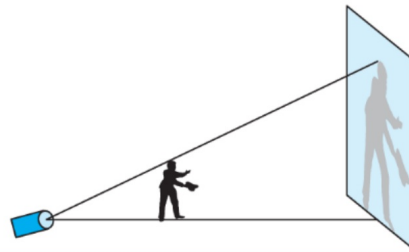
3



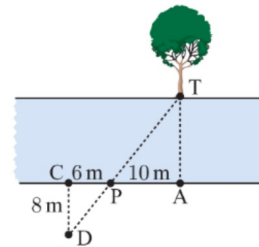
A lighthouse is situated 10 m back from the edge of a 35 m high cliff. The beacon is 8 m above the base of the lighthouse. How far from the cliff does the shadow extend?

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- 4 Curtis walks in front of an in-ground spotlight shining on a wall 5 m away. Curtis is 156 cm tall, and is 1.2 m from the spotlight. How tall is his shadow?



- 5 Enrico is standing at point A on one side of a river, directly opposite the tree T. 10 m along the bank is a post P. Enrico walks to P and then a further 6 m along the bank to C. He then walks 8 m directly away from the river until he reaches D, which is in line with P and T.
- Show that triangles CDP and ATP are similar.
 - How wide is the river at A?

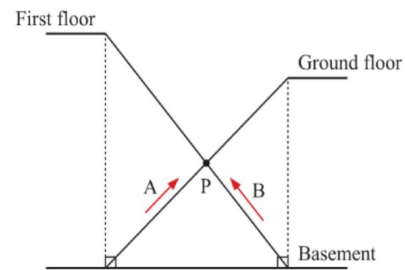


20E pg. 403 # 2, 3, 4, 5, 8

- 8 Alison and Brianna are in the basement of a department store.

Alison steps onto an escalator to the ground floor, and Brianna steps onto an escalator to the first floor. The escalators' paths cross at P. When Alison reaches P, she has completed $\frac{11}{20}$ of her escalator trip.

- What fraction of Brianna's escalator trip has been completed at P?
- Find the ratio of the height from the basement to the ground floor, compared with the height from the ground floor to the first floor.



20E pg. 403 # 2, 3, 4, 5, 8

SOLUTIONS

EXERCISE 20E

- | | | | |
|------------------|----------------|-----------------|-----------------|
| | 2 | a 1650 m | b 1677 m |
| 3 43.75 m | 4 6.5 m | 5 | b 13.3 m |