Please reflect for the week...

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 11/6 Topic: Continued Coloring Links	0 1 2	
Tuesday Date: 11/7 Topic: Fractals, Lucas #s, ...!	0 1 2	
Wednesday Date: 11/8 Topic: 6B Rational Equations	0 1 2	
Thursday Date: 11/9 Topic: Similar Figures WS	0 1 2	
Friday Date: 11/10 Topic: 20F: Area of similar objects	0 1 2	

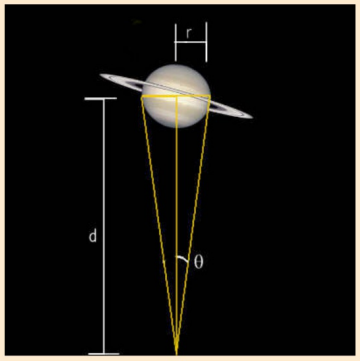
Class Plan:

1. Warm-up
2. Indirect Measurement

4. Practice!

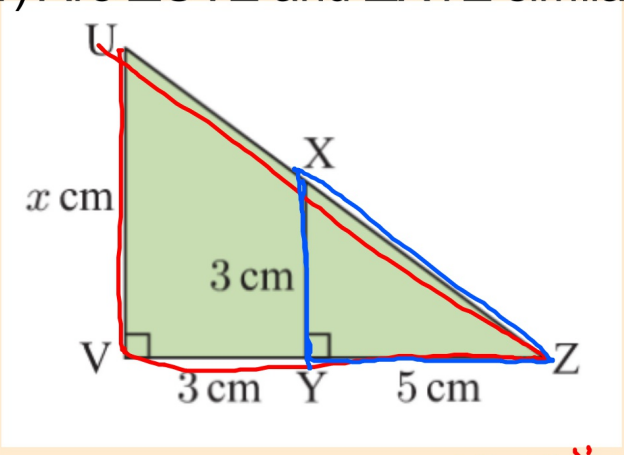
Today

How do we measure something we cannot reach?

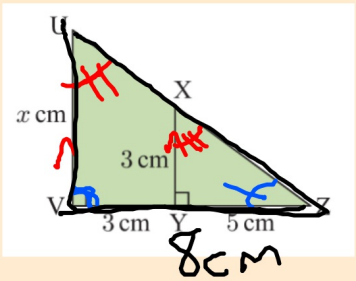


Warm-up: **Draw in notebook**

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



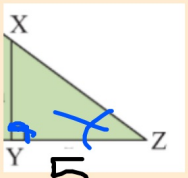
2)Find the value of *x*! "$\overline{UV}$"



8cm

By AA

3



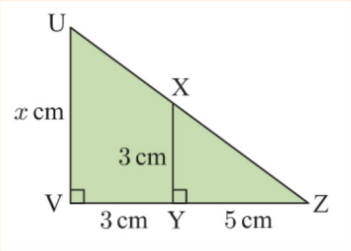
5

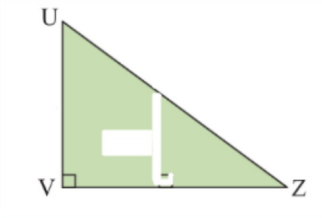
$$\frac{8}{5} = \frac{x}{3}$$

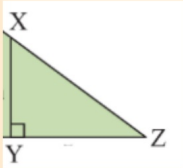
$$5x = 24$$

$$x = \frac{24}{5}\text{ cm}$$

1) Are ΔUVZ and ΔXYZ similar? Why or why not?
2)Find the value of *x*!







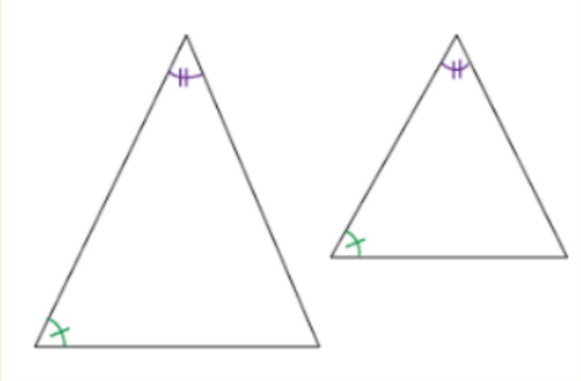
1) Are ΔUVZ and ΔXYZ similar? Why or why not?

1) Yes. Two corresponding angles are equal in measure. The third corresponding angle must be equal in measure, as all triangle angles sum to 180 degrees.

If all corresponding angles are equal in measure, the corresponding side ratios will be equal.

AA Similarity Postulate

If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.



20E Problem Solving

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**.

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.

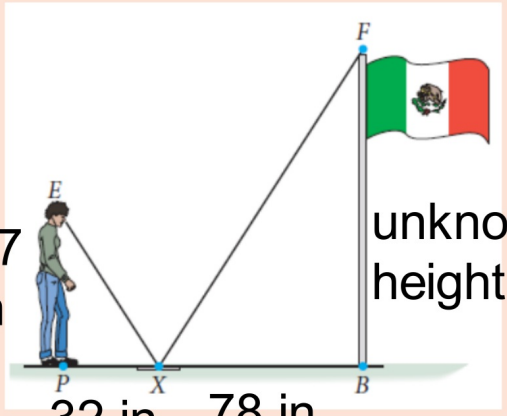
Step 3: Establish that a pair of triangles are similar, and hence set up an equation involving the variable.

Step 4: Solve the equation.

Step 5: Answer the question in a sentence.

Indirect Measurement

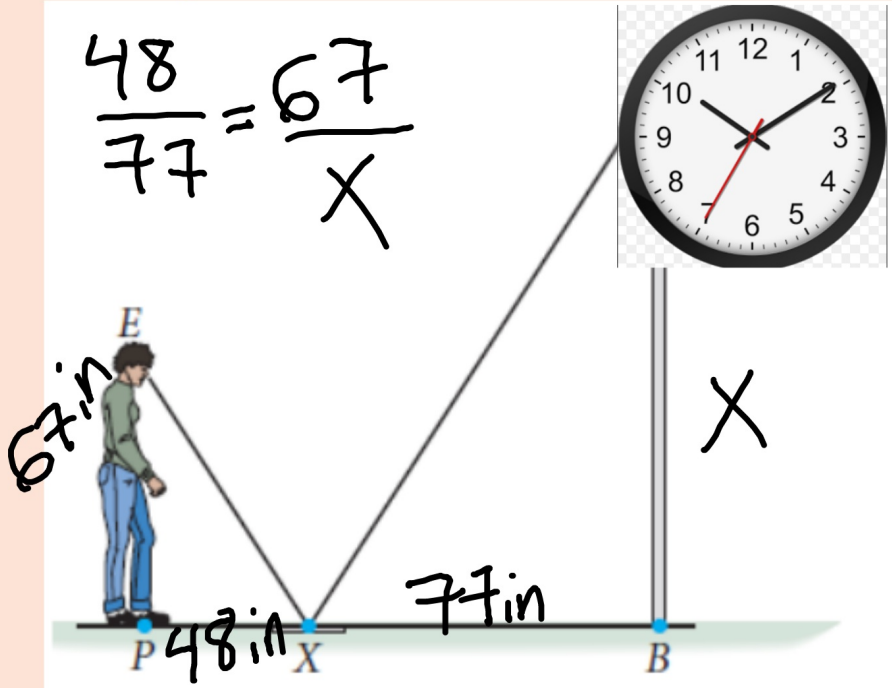
Find the height of an object beyond our reach.



Crosshairs: The point where the two bases of two similar triangles meet.

Example: How tall is the clock?!

$$\frac{48}{77} = \frac{67}{X}$$



Activity: 20E Similarity Problem Solving

(5-6 minutes to measure)

1. Find something you cannot reach.

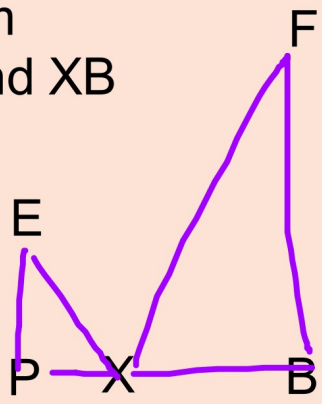
****Materials: Mirror, Measuring Tape*

2. Sketch your diagram

3. ~~Measure~~ EP, PX, and XB

4. Solve for FB

(come back to class)



When Done:

20E Problem Solving at table

What did we find the height of?!

TV height in commons

Vending Machine

Light in commons ≈ 41 ft?

Entryway light

"S" in Southwest

What did we find the height of?!

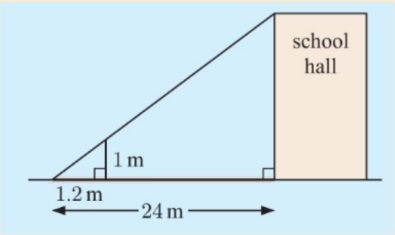
* Corner of "GARAGE 4" sign
* Romeo/Juliet Poster
* Garage 1 sign

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

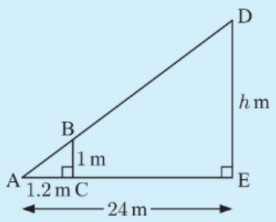
Example #1

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:

- $\widehat{ACB} = \widehat{AED} = 90°$
- $\widehat{A}$ 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.

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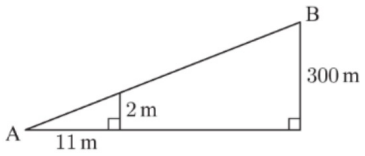
2 A road has a constant slope of 2 in 11. This means that if you travel 11 m horizontally along the road, you will rise 2 m.

a Over what horizontal distance will the road rise 300 m?

b What is the length of the road [AB] to the nearest metre?



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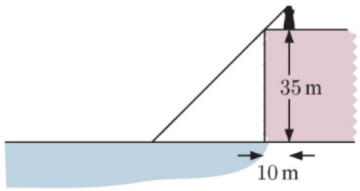

A lighthouse is situated 10 m back from the edge of a 35 m high cliff. The beacon is 8 m above the base of the lighthouse. How far from the cliff does the shadow extend?

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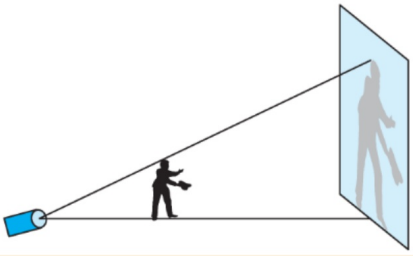
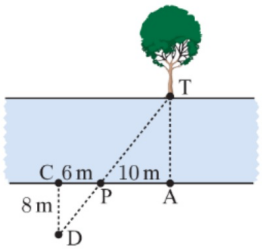
4 Curtis walks in front of an in-ground spotlight shining on a wall 5 m away. Curtis is 156 cm tall, and is 1.2 m from the spotlight. How tall is his shadow?



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.

a Show that triangles CDP and ATP are similar.

b How wide is the river at A?



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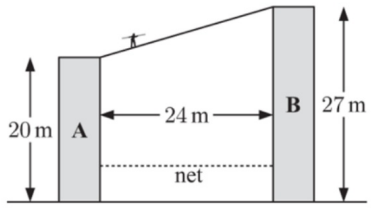
6 A tightrope walker is walking between the roofs of two buildings A and B. The buildings are 24 m apart. There is a safety net 5 m above ground level.

a Find the length of the tightrope.

b After travelling 15 m, the tightrope walker falls off. How far will he fall before landing in the net?



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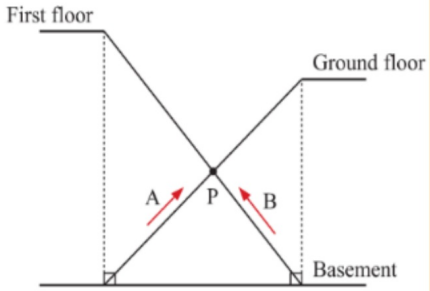
8 Alison and Brianna are in the basement of a department store.
Alison steps onto an escalator to the ground floor, and Brianna steps onto an escalator to the first floor. The escalators' paths cross at P. When Alison reaches P, she has completed $\frac{11}{20}$ of her escalator trip.

a What fraction of Brianna's escalator trip has been completed at P?

b 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.



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SOLUTIONS

EXERCISE 20E

1 9.22 m	**2** **a** 1650 m	**b** 1677 m
3 43.75 m	**4** 6.5 m	**5** **b** 13.3 m
6 **a** 25 m	**b** 19.2 m	**7** PR $\approx$ 3.67 m
8 **a** $\frac{9}{20}$	**b** 9 : 2	