MAKING & USING A

STUDY GUIDE

for a test

Study Guide: helps you 1 summarize, 2 visualize, and analyze 3 concepts learned in class

* Warning: simply making a study guide does not guarantee you an A+ on the test.
Study Guide for Exam-4: Using Similar Triangles

The picture shows a person taking a pinhole photograph of himself. Light entering the opening reflects his image on the wall, forming similar triangles. What is the height of the image to the nearest inch?

\[
\frac{h}{18} = \frac{67}{56}
\]

\[
\frac{56h}{56} = \frac{67(18)}{56}
\]

\[
h = 21.5
\]

The height of the image is about 22 inches tall.
Find all possible values of $x$ for which these two triangles are similar.

The only possible value of $x$ is $60^\circ$. 
Find the appropriate statements about the triangles.

\( \triangle ABC \) is similar to \( \triangle RTS \). Complete a proportion that contains \( AC \) and \( RT \). Also complete the angle congruence statements that must be true.

\[
\frac{AC}{RS} = \frac{AB}{RT}
\]

\( \angle A \cong \angle R \)

\( \angle B \cong \angle T \)

\( \angle C \cong \angle S \)
Find the length of segment $DG$ if $EC = 24$, $CF = 18$ and $ED = 32$.

By the Triangle Proportionality Theorem.

\[
\frac{24}{18} = \frac{32}{DG}
\]

\[
24 \times DG = 18 \times 32
\]

\[
DG = \frac{18 \times 32}{24}
\]

\[
DG = 24
\]

The length of segment $DG$ is $24$. 

Verify that the segments $RS$ and $TU$ are parallel, if the length of segments $TR = 24$, $VT = 30$, $US = 18$ and $VU = 22.5$.

\[ \frac{VT}{TR} = \frac{30}{24} = 1.25 \quad \text{and} \quad \frac{VU}{US} = \frac{22.5}{18} = 1.25 \]

Since, \[ \frac{VT}{TR} \overset{\text{(select)}}{=} \frac{VU}{US} \], \[ \frac{RS}{US} \overset{\text{(select)}}{=} \frac{TU}{VU} \], by the Converse of the Triangle Proportionality Theorem.
Find the length of segment $KL$, if the length of segment $JL = 8$, segment $GJ = 12$ and segment $HK = 16$. Enter your answer as a fraction or mixed number.

The length of segment $KL = \boxed{\phantom{0}}$. 

\[
\frac{12}{8} = \frac{16}{x}
\]

\[
12x = 2\cdot 8 \cdot 16
\]

\[
x = \frac{32}{3} \text{ or } 10 \frac{2}{3}
\]
Find the length of segment $VM$, if the length of segment $NT = 14$, segment $MU = 8$ and segment $VT = 49$.

\[
\frac{8}{x} = \frac{14}{35}
\]

\[
8 \left(\frac{35}{14}\right) = \frac{14x}{14}
\]

\[
x = 30
\]

The length of segment $VM = 30$. 
Verify that \( \overline{AB} \) and \( \overline{CD} \) are parallel. \( EC = 6, \ CA = 2, \ ED = 11 \) and \( DB = \frac{2}{3} \).

\[ \frac{ED}{DB} = \boxed{3} \quad \text{and} \quad \frac{EC}{CA} = \boxed{3} \]

\[ \frac{ED}{DB} = \boxed{\frac{11}{3.7}} \quad \frac{EC}{CA} = \boxed{\frac{6}{2}} \]

So, \( \overline{AB} \) and \( \overline{CD} \) are parallel. \( 3 = 3 \).
Verify that $QR$ and $MN$ are parallel. The length of segment $MQ = 2.7$, $NR = 3$, $PQ = 9$ and $PR = 10$.

\[
\frac{PM}{MQ} = 2.33 \quad \text{and} \quad \frac{PN}{NR} = 2.33
\]

So, $QR$ and $MN$ are parallel.
Notes for Exam-4

#10

1
For what value of $x$ is $\overline{GF} \parallel \overline{HJ}$?

$4x + 4 = \frac{5x + 1}{56}$

$63(4x + 4) = 56(5x + 1)$

$252x + 252 = 280x + 56$

$-280x - 252 = -280x - 252$

$-28x = -196$

$x = 7$
Liam is 5.6 feet tall. To find the height of a tree, he measures his shadow and the tree's shadow. The measurements of the two shadows are shown. Find the height $h$ of the tree. Round to the nearest tenth if necessary.

The height of the tree is 19.6 feet.
To find the distance $d$ across a stream, Levi located points as shown in the figure. Use the given information to find $d$. Round your answer to the nearest tenth if necessary.

The distance $d$ is $14.4$ meters.
Notes for Exam-4

Use similar triangles \( \triangle ABC \) and \( \triangle XYZ \) to find the missing height \( h \). Round to the nearest tenth if necessary.

The height is \( \boxed{86.6} \) feet.
In order to find the height of a cliff, you stand at the bottom of the cliff, walk 60 feet from the base, and place a mirror on the ground. Then you face the cliff and step back 5 feet so that you can see the top of the cliff in the mirror. Assuming your eyes are 5.2 feet above the ground, explain how to use this information to find the height of the cliff. (The angles marked congruent are congruent because of the nature of the...)

\[
\frac{5.2}{5} = \frac{x}{60}
\]

\[
60(5.2) = 5x
\]

\[
x = 62.4
\]

The height of the cliff is about 62 feet.
A city is planning an outdoor concert for an Independence Day celebration. To hold speakers and lights, a crew of technicians sets up a scaffold with two platforms by the stage. The first platform is 8 feet 2 inches off the ground. The second platform is 7 feet 6 inches above the first platform. The shadow of the first platform stretches 6 feet 2 inches across the ground.

A technician is 5 feet 8 inches tall. The technician is standing on top of the second platform. Find the length $s$ of the shadow that is cast by the scaffold and the technician to the nearest inch.

The length of the shadow cast by the scaffold and the technician is ______ feet ______ inches.
A city is planning an outdoor concert for an Independence Day celebration. To hold speakers and lights, a crew of technicians sets up a scaffold with two platforms by the stage. The first platform is 8 feet 2 inches off the ground. The second platform is 7 feet 6 inches above the first platform. The shadow of the first platform stretches 6 feet 3 inches across the ground. Find the length of the shadow of the second platform in feet and inches to the nearest inch.

The length of the shadow of the second platform is **5** feet **6** inches.
To find the height $x$ of a flagpole, Casey measured her own shadow and the flagpole's shadow. Given that Casey's height is 5 feet 4 inches, what is the height of the flagpole? Round to the nearest tenth if necessary.

The height of the flagpole is $\boxed{381}$ inches.

$$\frac{64}{36} = \frac{x}{171}$$

$$36x = 264(171)$$

$$x = \frac{264(171)}{36}$$

$$x = 384$$

$5(\text{ft}) + 4 = 64'$

$14(\text{ft}) + 3 = 171'$
A student wanted to find the height $h$ of a statue of a pineapple in Nambour, Australia. She measured the pineapple’s shadow and her own shadow. The student’s height is 5 feet 2 inches. What is the height of the pineapple? Round to the nearest tenth if necessary.

\[
\frac{62}{24} = \frac{h}{105}
\]

\[
24h = 6510
\]

\[
h = 271.25
\]

The height of the pineapple is 271.3 inches tall.
Find $x$.

The value of $x$ is $\sqrt{141}$.

Enter as Radical.

\[ \frac{7}{x} = \frac{x}{11} \]

\[ \sqrt{x^2} = 5 \sqrt{2} \]

\[ x = \sqrt{122} \]
Find $x$, $y$, and $z$. Drag and drop the numbers into the boxes to show the value of each variable.

$\# \ 23$

$15^2 = 9^2 + y^2$

$15^2 - 9^2 = y^2$

$\sqrt{15^2 - 9^2} = y$

$\sqrt{144} = y$

$12 = y$

Take a guess for $z$

$x = 16$

$y = 12$

$z = \boxed{144/9}$

$x = 16$