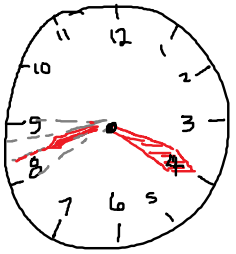
Homework Qs

1.1 #37] Find the measure of the smaller angle formed by the hands of a clock at the specified time.

8:20



8:20 minute hand is exactly on 4 (20 min)

The hour hand is partway between 8 and 9

20 min is $\frac{1}{3}$ of 60 min, so hour hand is $\frac{1}{3}$ of the way from 8 to 9

Each hour division of the clock is how many degrees?

One full circle is 360°

So each hour division is $\frac{1}{12}(360^\circ) = 30^\circ$

This should get you started....take it from there!

1.2 Similar Triangles

The sum of the measures of the angles in any triangle is $180°$.

Ex. If two angles in a triangle are $136°50'$ and $41°38'$, Find the third angle.

$$\begin{array}{r} 136°50' \\ 41°38' \\ \hline 177°88' \end{array} \Rightarrow 178°28'$$

$$\begin{array}{r} 180°00' \\ -178°28' \\ \hline 1°32' \end{array}$$

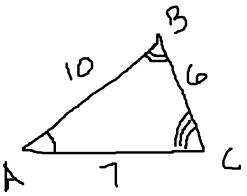
The third angle is $1°32'$

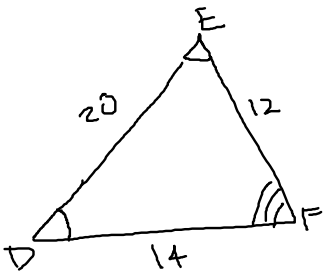
Similar Triangles. Same shape, but possibly different size, position, or orientation.

If 2 triangles are similar, then:

1) Corresponding angles have the same measure.
2) Corresponding sides are proportional.

Example





$\angle A = \angle D$

$\angle B = \angle E$

$\angle C = \angle F$

$$\frac{AB}{DE} = \frac{10}{20} = \frac{1}{2}$$

$$\frac{BC}{EF} = \frac{6}{12} = \frac{1}{2}$$

$$\frac{AC}{DF} = \frac{7}{14} = \frac{1}{2}$$

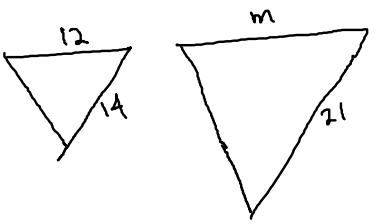
} all equal if triangles are similar.

are equal also

$$\frac{BC}{AB} = \frac{6}{10} = \frac{3}{5} \quad \text{also} \quad \frac{EF}{DE} = \frac{12}{20} = \frac{3}{5}$$

Ex: Find the missing side.

Ex: These triangles are similar.



Find m.

$$\frac{m}{12} = \frac{21}{14}$$

$$m = \frac{3}{\cancel{21}} \cdot \frac{12}{1} = \frac{3 \cdot 12}{2} = \frac{36}{2} = 18$$

$$\boxed{m = 18}$$

OR

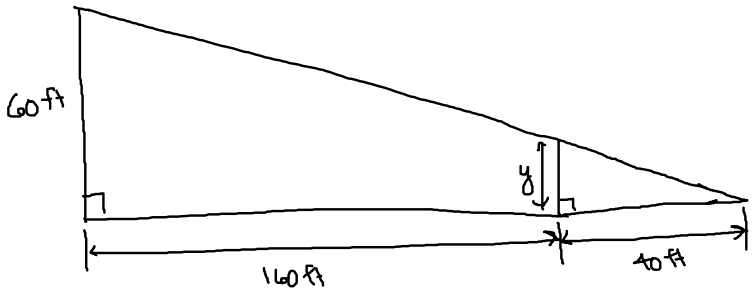
$$\frac{12}{14} = \frac{m}{21}$$

$$\frac{6}{7} = \frac{m}{21}$$

$$\frac{3}{\cancel{21}} \cdot \frac{6}{\cancel{7}} = m$$

$$m = \frac{18}{1} = 18$$

Example:



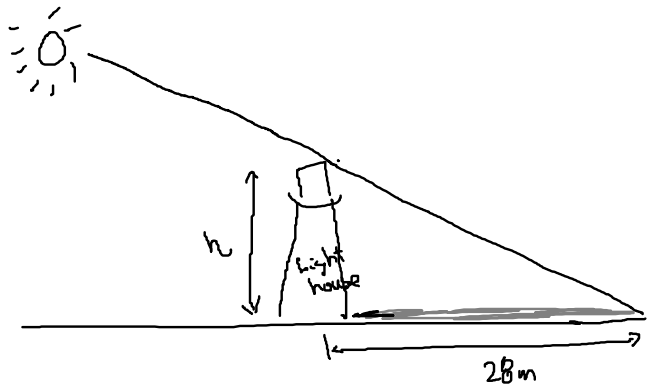
Find y.

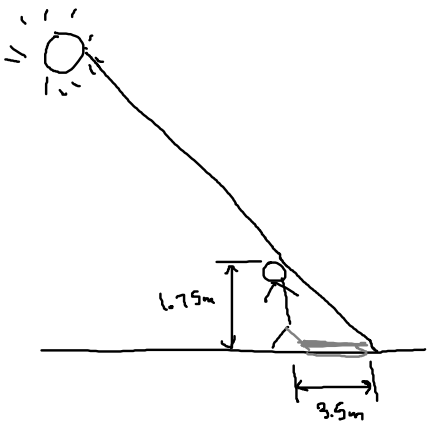
$$\frac{y}{40\text{ ft}} = \frac{60\text{ ft}}{200\text{ ft}}$$

$$y = \frac{60}{200} \cdot \frac{40\text{ ft}}{1}$$

$$= \frac{6}{20} \cdot 40\text{ ft} = \frac{240}{20}\text{ ft} = \boxed{12\text{ ft}}$$

Ex: A lighthouse casts a shadow 28 m long. At the same time, the shadow of the lighthouse keeper, who is 1.75 m tall, is 3.5 m long. How tall is the lighthouse?





$$\frac{h}{28m} = \frac{1.75m}{3.5m}$$

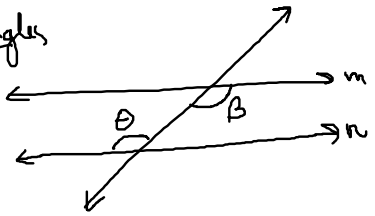
$$h = \frac{1.75\cancel{m}}{3.5\cancel{m}} \cdot 28m \approx 14 \text{ m}$$

The lighthouse is 14 m high.

Parallel Lines and Transversals

A transversal is a line that intersects two parallel lines.

Alternate interior angles

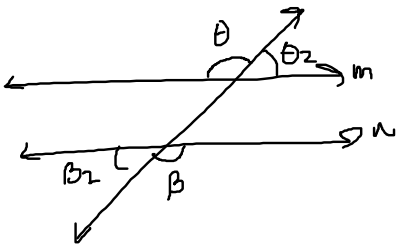


$m \parallel n$
(m is parallel to n)

Angles θ and β are equal

Alternate exterior angles

$m \parallel n$

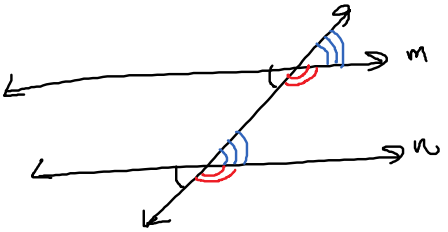


$\theta = \beta$

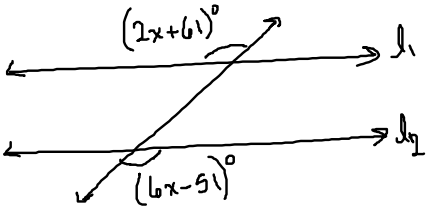
Also $\theta_2 = \beta_2$

Corresponding angles

$m \parallel n$



Ex.



$l_1 \parallel l_2$

Alternate exterior angles are equal, so $(2x+61)^\circ = (6x-51)^\circ$

$2x + 61 = 6x - 51$

$-2x \quad -2x$

$61 = 4x - 51$

$+51 \quad +51$

$112 = 4x$

$\frac{4x}{4} = \frac{112}{4}$

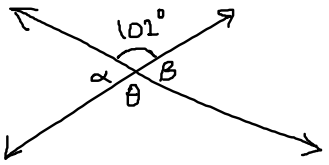
$x = \frac{56}{2} = 28$

$x = 28$

Vertical Angles

When 2 lines intersect, 4 angles are formed.
The angles opposite each other are called vertical angles

Vertical angles have the same measure.



Find α, θ, β.

θ: theta
β: Beta
α: alpha

$\theta = 102°$

$\alpha + 102° = 180°$

$\alpha = 78°$

$\beta = 78°$