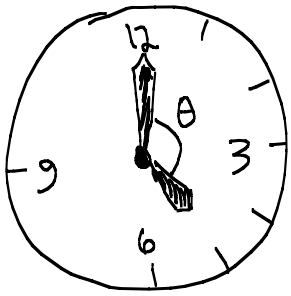
Homework Qs

Note Title 1/22/2019

1.1 Find the angle between the hands on a clock that reads 3:15.

Note: For a clock at 5:00:



$\frac{1}{12}(360^\circ) = 30^\circ$

At 5:00:

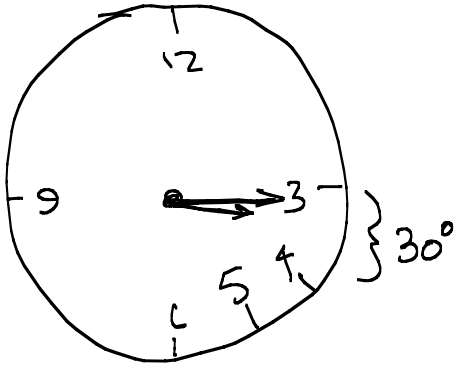
$30^\circ(5) = 150^\circ$

or $\frac{5}{12}(360^\circ) = 150^\circ$

At 3:15

minute hand at 3.

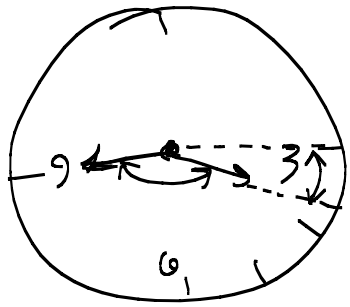
Hour hand $\frac{1}{4}$ of the way between 3 and 4



$\frac{1}{4}(30^\circ) = \frac{30^\circ}{4} = \frac{15^\circ}{2}$

$= \boxed{7.5^\circ}$

At 3:45



short hand is $\frac{3}{4}$ of the way between 3 and 4.

$\frac{3}{4}(30^\circ) = \frac{90^\circ}{4} = 22.5^\circ$

Angle between the hands is $180^\circ - 22.5^\circ$

$= 157.5^\circ$

1.2.1

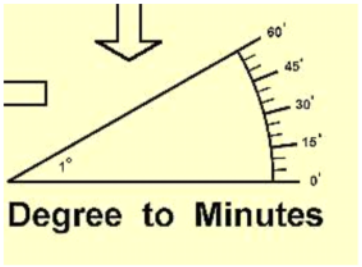
Degrees, Minutes, and Seconds

1 degree is made up of 60 smaller parts called **minutes.**

60′ ← minutes

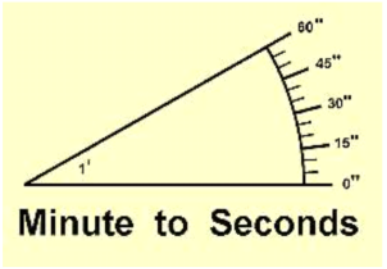
1 degree = 60 minutes → $1^\circ = 60'$
AND
1 minute = $\frac{1}{60}$ degree → $1' = \frac{1}{60}^\circ$

60″ ← seconds



1 minute is made up of 60 smaller parts called **seconds.**

1 minute = 60 seconds → $1' = 60''$
AND
1 second = $\frac{1}{60}$ minute → $1'' = \frac{1}{60}'$

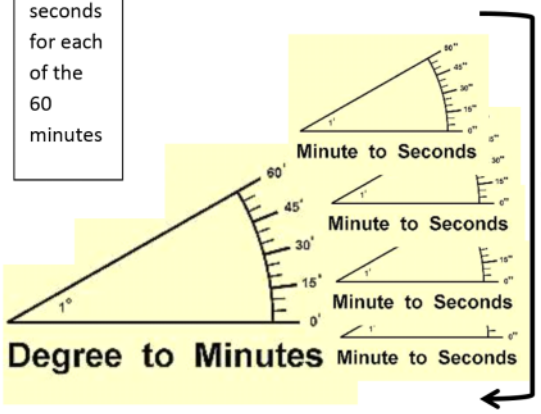


$1 \text{ degree}\left(\frac{60 \text{ min}}{1 \text{ degree}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right)$

$= 3600 \text{ sec}$

Question: How many seconds make up 1 degree?

60 seconds for each of the 60 minutes



1 degree = 3600 seconds
AND
1 second = $\frac{1}{3600}$ degree

1.2.2

Calculations with Degrees, Minutes, and Seconds

Example: Perform each calculation.

a) $28° 35′ + 63° 52′$

$28^\circ 35' + 63^\circ 52'$

$91^\circ 87'$

$92^\circ 27'$

$87 - 60 = 1^\circ$

27

b) $180° - 117° 29′$

$180^\circ - 117^\circ 29'$

$179^\circ 60' - 117^\circ 29'$

$62^\circ 31'$

c) $73° 23′ - 47° 48′$

$73^\circ 23' - 47^\circ 48'$

$72^\circ 83' - 47^\circ 48'$

$25^\circ 35'$

Converting an angle measure to decimal degrees (to the nearest thousandth)

$105° 20′ 32″$

$105^\circ + \frac{20}{60}^\circ + \frac{32}{3600}^\circ$

$= 105.342727\overline{2}^\circ$

$= 105.342^\circ$

To convert to decimal degrees:

1) The degrees should be placed as written before the decimal.
2) Divide the minutes by 60 and the seconds by 3600.
3) Input into calculator. (don't round yet)
4) Add together and round to the nearest thousandth.

Converting decimal degrees into degrees, minutes, and seconds

$85.263°$

$85^\circ + 0.263^\circ$

$= 85^\circ + 0.263^\circ \left(\frac{60'}{1^\circ}\right)$

$= 85^\circ + 15.78'$

$= 85^\circ 15' + 0.78'$

$= 85^\circ 15' + 0.78' \left(\frac{60''}{1'}\right)$ $= 85^\circ 15' + 46.8''$

$= 85^\circ 15' 47''$

To convert to degrees, minutes, and seconds:

1) The part before the decimal is the degrees.
2) Multiply the decimal portion by 60′. This portion is now converted into minutes. The part before the decimal is now the whole minutes.
3) Multiply the remaining decimal portion by 60″. This portion now converted into seconds. Round to the nearest whole second.

1.2.3

Section 1.2 Similar Triangles

Properties of Triangles

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

Example: The measure of two of the angles of a triangle are $136° 50'$ and $41° 38'$. Find the measure of the third angle.

$136°50' + 41°38' = 177°88' = 178°28'$

$(88' - 60' = 28')$

$180°0' - 178°28'$

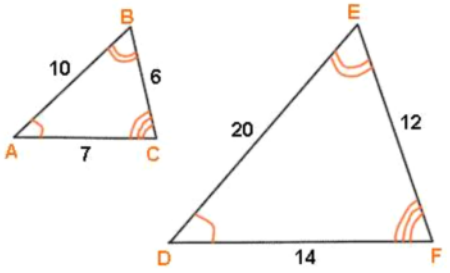
$179°60' - 178°28' = 1°32'$

3rd angle is $1°32'$

Similar triangles are triangles of exactly the same shape but not necessarily the same size.

In similar triangles,

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



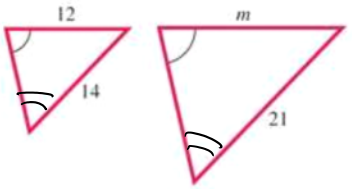
Facts about similar triangles:	
$\measuredangle A \cong \measuredangle D$	$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
$\measuredangle B \cong \measuredangle E$	
$\measuredangle C \cong \measuredangle F$	

$\frac{14}{7} = \frac{12}{6} = \frac{20}{10}$

(all equal to 2)

1.2.4

Example: Find the unknown side lengths. m = 18



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

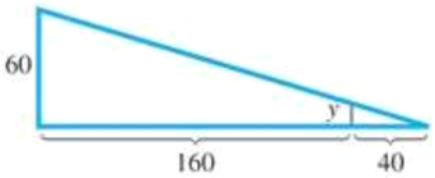
cross-multiply: $14m = 12(21)$

$m = \frac{12(21)}{14} = 18$

Note: $\frac{14}{12} = \frac{21}{18}$

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

y = _____



Example:

Height of a Lighthouse The Biloxi lighthouse in the figure casts a shadow 28 m long at 7 p.m. 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?