Preliminary Questions! **You may refer to this information anytime when doing the practice questions on the next page!**

Complete each sentence. **NAME:** _____

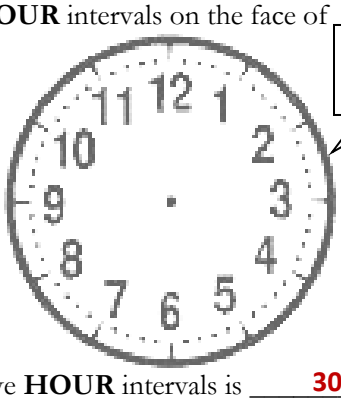
1) The number of degrees contained by every circle is _____**360⁰**_____.

2) Every straight angle contains _____**180⁰**_____ degrees, and the number of degrees contained by a semicircle is _____**180⁰**_____.

3) The sides of an angle are composed of two _____**rays**_____ that share a common _____**vertex**_____.

4) The face of an analogue clock is a _____**circle**_____ and there are _____**12**_____ **HOUR** intervals on the face of an analogue clock.
(What shape?)

5) There are _____**60**_____ **MINUTE** intervals on the face of an analogue clock.



$\frac{360}{12}$

$= 30^0$

Use with Question #6:
Draw an angle with vertex located at the center of an analogue clock with the two rays that are its sides going through points on consecutive **HOUR** numbers.

6) The amount of the rotation between the rays that form angles using two consecutive **HOUR** intervals is _____**30⁰**_____ ⁰.

Hint! Use your answers to questions 1 & 4.

$\frac{360}{60}$

$= 6^0$

Use with Question #7:
Consider making an angle with vertex at the center of an analogue clock with the two rays that are its sides going through points at consecutive **MINUTE** tick marks.

7) The amount of the rotation between the rays that form angles using two consecutive **MINUTE** intervals is _____**6⁰**_____ ⁰.

Hint! Use your answers to questions 1 &

Remember **RATE** is a **ratio** that shows the comparison between two quantities that are measured using *different* units.

8A) What is the **RATE** of travel for the **minute hand** as it travels around the face of an analogue clock?

$$\frac{D}{M} = \frac{360\ degrees}{60\ min} = \frac{6\ degrees}{1\ minute}$$

8B) What is the **RATE** of travel for the **hour hand** as it travels around the face of an analogue clock?

$$\frac{D}{M} = \frac{30\ degrees}{60\ min} = \frac{\frac{1}{2}degree}{1\ minute}$$

9) What is the **RATIO** representing the number of degrees per minute for HOUR hand compared to the MINUTE hand?

Step 1: $\frac{Minute\ Hand}{Hour\ Hand} = \frac{6}{\frac{1}{2}} = \frac{12}{1}$ Step 2: $\frac{Hour\ Hand}{Minute\ Hand} = \frac{1}{12}$ So the hour hand travels $\frac{1}{12}$ the distance of the minute hand!

10) How could you use the number of minutes elapsed to determine how far the hour hand has moved into the next region located between two hour intervals on the face of an analogue clock for any given time? (AWV -- Answers Will Vary)

$\frac{1}{12}$ *the distance traveled by the minute hand,*

which is $\frac{1}{12}$ *of* (6^0) *times (the number of minutes elaspsed) or* $\frac{1}{2}$ *degree for every minute elapsed!*

Advanced Geometry
Chapter 1, section 2 "Clock Angle Problems"

Name: _____
Class Period: _____

Instructions to follow for each problem:

A) Use the given time to place the minute and hour hand on the clock.
B) Draw an arc marking the angle whose measure you are finding for that time.
C) Calculate the measure of the angle using the method next to the time.
D) Classify the angle according to its measure.

Equation: For any given time,

Let h = hours and m = minutes

then,

$$m\measuredangle = \left|\left[30h + \frac{1}{2}m\right] - 6m\right|$$

Hint: Draw the minute hand first, and then think about where the hour hand should go!

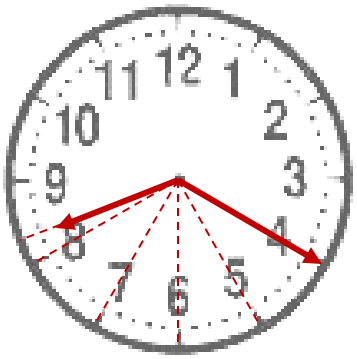
1) **TIME: 8:20** (*Addition Method*)

$$= 4(30^0) + \frac{20\ \cancel{min}}{60\ \cancel{min}}(30^0)$$

$$= 120^0 + \frac{1}{3}(30^0)$$

$$= 120^0 + 10^0$$

$$= 130^0$$



Answer 1

Degrees:

_____130⁰_____

Classification:

__obtuse__

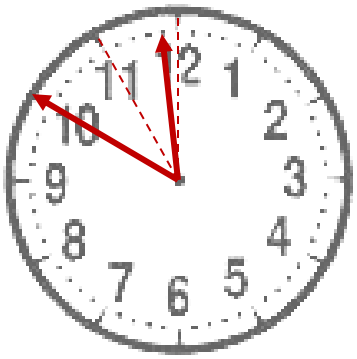
2) **TIME: 11:50** (*Subtraction Method*)

$$= 2(30^0) - \frac{10\ \cancel{min}}{60\ \cancel{min}}(30^0)$$

$$= 60^0 - \frac{1}{6}(30^0)$$

$$= 60^0 - 5^0$$

$$= 55^0$$



Answer 2

Degrees:

_____55⁰_____

Classification:

___acute___

FOR QUESTION #3: You will draw two angles, STARTING WITH A RAY LOCATED AT 12 for both angles.

1) Draw the angle formed by the **MINUTE hand** first and then shade the angle with a color of your choice.
2) Start at 12 again and draw the angle formed by the **HOUR hand**. (Be careful! Should it really be "on" the hour number?)
3) Using a different color, shade the angle formed by the hour hand.
4) Draw an arc to mark **the smaller angle** formed between the two **CLOCK HANDS (rays)**.
5) The minute hand is easy, but how would you determine the total measure of the angle formed by the hour hand from 12?
6) Calculate the difference between the two angles.

FINALIZING YOUR RESULTS:

If your difference is:
* **180 or less, you are finished!**
* **Negative, but with absolute value of 180 or less, use the absolute value!**
* **Greater than 180, subtract it from 360!**

3) **TIME: 5:10** (*Equation Method*) Let: **h = 5 m = 10**

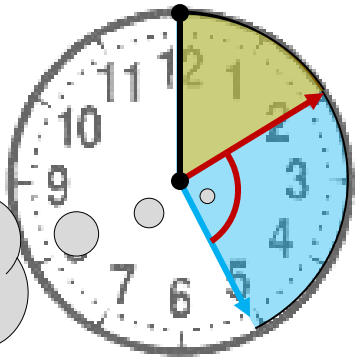
$$m\measuredangle = \left[\underset{\text{(Hour hand angle)}}{30^0(\ 5\ )} + \frac{6^0(10)}{12}\right] - \underset{\text{(Minute hand angle)}}{6^0(\ 10)}$$

$$m\measuredangle = \left[150^0 + \tfrac{1}{2}(10)\right] - 60^0$$

$$m\measuredangle = \left[150^0 + 5^0\right] - 60^0$$

$$m\measuredangle = [155^0] - 60^0 = 95^0$$

THINK... "the angle formed by the hour hand minus the angle formed by the minute hand."



Answer 3

Degrees:

___95⁰____

Classification:

__obtuse__