

Analog Clock

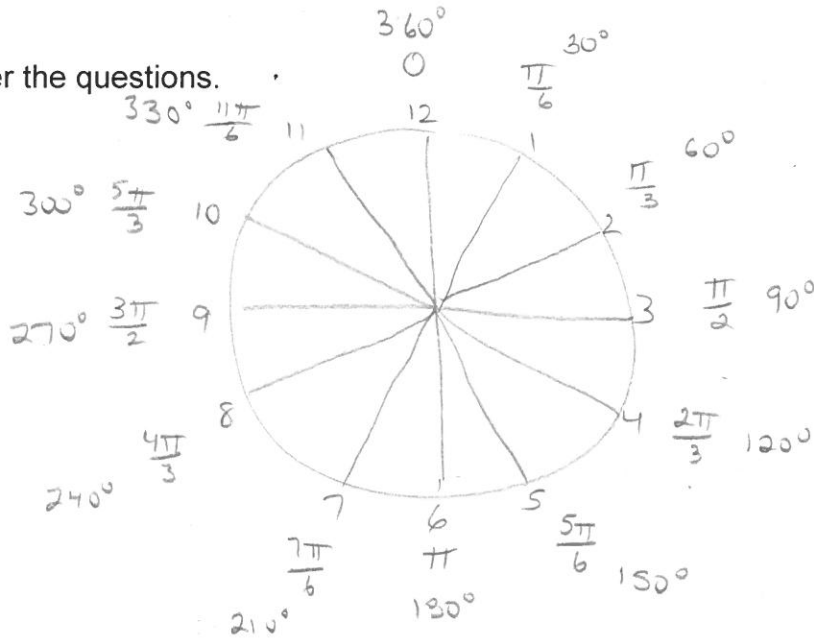


Name: Key Period: _____

Your task is to design a 12-hour circular analog clock. Each digit will be equally spaced, with 12 at the topmost position.

1. Sketch a diagram of the clock.
2. Draw the x-axis through the 9 and 3 and the y-axis through the 12 and 6.
3. Fill in the remaining hours.
4. Label each hour with the degree measure and radian measure that correspond to that hour's position.

Use the sketch to answer the questions.



1. If the hour hand is at the measure indicated below, what hour does the clock read?

- | | | | |
|----------------|-----------------|--------------------|-----------------------|
| a. 300° | b. -210° | c. $\frac{\pi}{3}$ | d. $\frac{-11\pi}{6}$ |
| <u>10:00</u> | <u>5:00</u> | <u>2:00</u> | <u>1:00</u> |

2. If the clock hands are at the indicated locations below, what time does the clock read?

- Hour hand is at 120° and the minute hand is at -120° . 4:40
- Hour hand is at $\frac{-\pi}{6}$ and the minute hand is at $\frac{7\pi}{6}$. 11:35
- Hour hand is at $\frac{-5\pi}{3}$ and the minute hand is at 480° . 2:20
 $\frac{-360}{120}$
- Hour hand is at -510° and the minute hand is at $\frac{11\pi}{3}$. 7:50
 $\frac{360}{-150}$ $\frac{32}{3}$

3. What is the length of the radius of your clock? Unit Circle Radius 1

4. What are the central angle measure (in both radians and degrees) and arc length between each hour on the clock?

θ (degrees): 30°

arc length: $\frac{\pi}{6} \approx .523$

θ (radians): $\frac{\pi}{6}$

5. What are the central angle measure (in both radians and degrees) and the arc length between the 12 and the 6 on your clock?

θ (degrees): 180°

arc length: $\pi \approx 3.14$

θ (radians): π

6. What are the central angle measure (in both radians and degrees) and the arc length between the 2 and the 9 on your clock?

$+\theta$ (degrees): 210°

$-\theta$ (degrees): -150°

$+\theta$ (radians): $\frac{7\pi}{6}$

$-\theta$ (radians): $-\frac{5\pi}{6}$

arc length: $\frac{7\pi}{6} \approx 3.67$

arc length: $\frac{5\pi}{6} \approx 2.62$

7. What are the central angle measure (in both radians and degrees) and the arc length between the hour hand of 2:30 and the hour hand of 8 on your clock?

$+\theta$ (degrees): 165°

$-\theta$ (degrees): -195°

$+\theta$ (radians): $\frac{11\pi}{12}$

$-\theta$ (radians): $-\frac{13\pi}{12}$

arc length: $\frac{11\pi}{12} \approx 2.88$

arc length: $\frac{13\pi}{12} \approx 3.40$

8. What are the central angle measure (in both radians and degrees) and the arc length between the hour hand of 10:30 and the hour hand of 7 on your clock?

$+\theta$ (degrees): 255°

$-\theta$ (degrees): -105°

$+\theta$ (radians): $\frac{17\pi}{12}$

$-\theta$ (radians): $-\frac{7\pi}{12}$

arc length: $\frac{17\pi}{12} \approx 4.45$

arc length: $\frac{7\pi}{12} \approx 1.83$