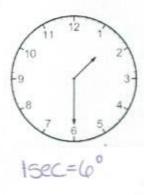
Arc Length, Angular Velocity & Linear Velocity

Name: Period:___

Find the length of the arc, L, of a circle with radius, r, intercepted by a central angle, θ . Express arc length (L) in terms of π . (Round your answer to the nearest hundredth.)

	Radius, r	Central Angle, θ
1	12 inches	Θ = 45°
2	16 inches	Θ = 75° 511
3	8 feet	Θ = 225° 5
4	24 yards	Θ = 320° let

Find the positive radian measure of the angle that the second hand of a clock moves through in the given time.

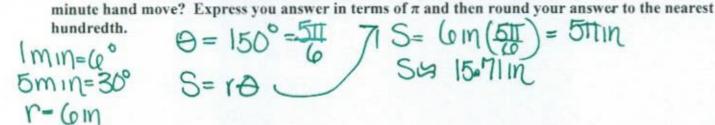


5. 55 seconds

Solve the problems.

9. The minute hand of a clock is 9 inches long and moves from 12 to 2. How far does the tip of the minute hand move? Express you answer in terms of π and then round your answer to the nearest hundredth.

$$\theta = 60^{\circ} = \frac{1}{3}$$
 $r = 9in$
 $S = r6 = 9 \cdot \frac{1}{3} = 3\pi = 9.42 \cdot n$



Use the fact that the earth is a sphere with a radius approximately equal to 4000 miles to solve problems 11-13.

10. The minute hand of a clock is 6 inches long and moves from 11 to 4. How far does the tip of the



11. If two points A and B are 8000 miles apart, express and θ in radians and degrees.



12. If $\theta = 10^{\circ}$, find the distance between A and B to the nearest mile.

$$0 = 10^{\circ} = \frac{11}{18}$$

 $S = 4000 \cdot 11 = 400011 = 698.13 \text{ m}_{1} \approx 698 \text{ m}_{1} \text{ les}$

13. If the angular speed of the earth is $\frac{\pi}{12}$ radians per hour. The Equator lies on a circle of the radius approximately 4000 miles. Find the linear velocity of a point on the Equator in miles per hour.

$$W = \frac{\pi}{12}$$
 r=4000
 $V = r\omega = \frac{4000 \text{ m}}{12} = \frac{1000 \text{ m}}{3} \approx 1047.20 \text{ mph}$

14. A water wheel has a radius of 12 feet. The wheel is rotating at 20 revolutions per minute. Find the linear speed, in feet per minute.

15. The second hand of a clock is 10.2 centimeters long. Find the linear speed of the tip of the second hand as it passes around clock face.

$$r = 10.2 cm$$
 $lrev = 60sec$
 $V = r0$
 $V = r0$
 $V = 10.2 cm$
 $V = 10.2$

- A lawn roller with a 10 inch radius rotates 1.2 revolutions per second.
 - a. Find the angular speed per of the roller per second.

Find the linear speed of the roller in miles per hour.