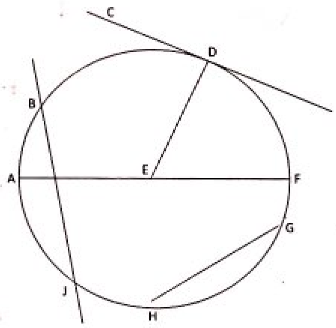
Math III Unit 5 Test 1 Review

Name KEY



Identify the following:

Circle: $\odot E$

Radius: $\overline{AE}, \overline{DE}, \overline{FE}$

Chord: $\overline{HG}$

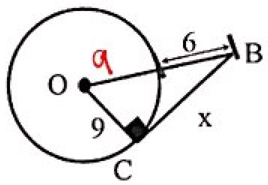
Tangent: $\overleftrightarrow{CD}$

Secant: $\overleftrightarrow{JB}$

Minor Arc: $\overset{\frown}{AD}, \overset{\frown}{AJ}, \overset{\frown}{JF}$

Major Arc: $\overset{\frown}{AGD}, \overset{\frown}{DJB}$

} example answers

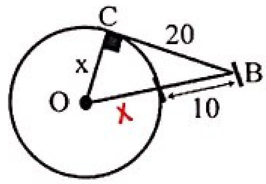


$\overline{CB}$ tangent.

Find x.

$9^2 + x^2 = 15^2$

$\boxed{x = 12}$



$\overline{CB}$ tangent.

Find x.

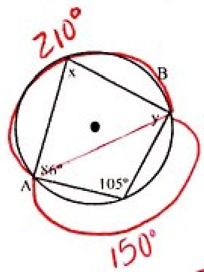
$x^2 + 20^2 = (10+x)^2$

$x^2 + 400 = x^2 + 20x + 100$

$300 = 20x$

$\boxed{15 = x}$

What is the measure of $\angle A$?

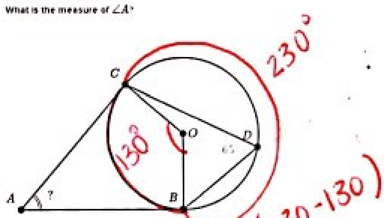


Given circle with center indicated and inscribed quadrilateral.

Find x and y.

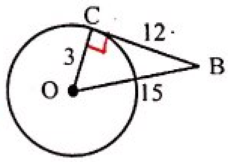
$\boxed{x = 75°}$

$\boxed{y = 94°}$



$? = \frac{1}{2}(230 - 130)$

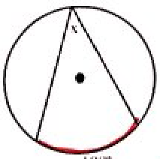
$\boxed{? = 50°}$



In the diagram at the left, is $\overline{CB}$ a tangent?

($OB = 15$)

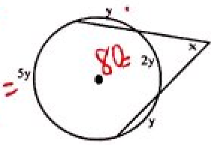
$153 \neq 225$ $\emptyset$ $\boxed{NO}$



Given circle with center indicated.

Find x.

$\boxed{x = 54°}$



$200 =$

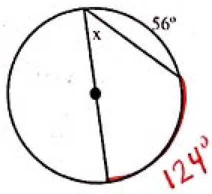
Given two secants, find x
Hint: find y first.

$9y = 360$

$y = 40$

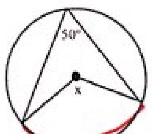
$x = \frac{1}{2}(200 - 80)$

$\boxed{x = 60°}$



Solve for x.

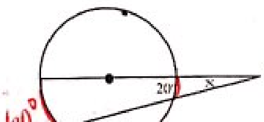
$\boxed{x = 62°}$



Given circle with center indicated.

Find x.

$X = 100°$

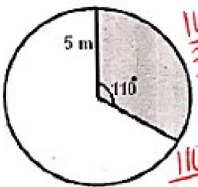


Given two secants with one going through the center of the circle, find x.

$X = \frac{1}{2}(60 - 20)$

$X = 20°$

For each circle, find the length of the given arc as well as the area of each shaded sector.

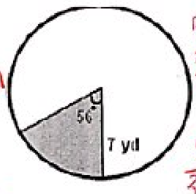


$\frac{110}{360} 2\pi(5)$

length ≈ 9.6m

$\frac{110}{360} \pi(5^2)$

area ≈ $24 m^2$

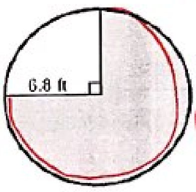


$\frac{56}{360} 2\pi(7)$

length ≈ 6.8yd

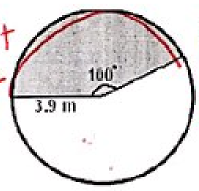
$\frac{56}{360} \pi(7^2)$

area ≈ $23.9 yd^2$



length ≈ 32ft

area ≈ $109 ft^2$



length ≈ 6.8m

area ≈ $13.3 m^2$

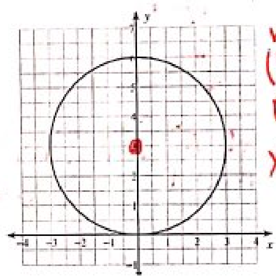
Write an equation for the following circles:

Center: (-11, -8)
Radius: 4

$(x+11)^2 + (y+8)^2 = 16$

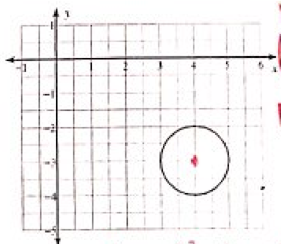
Center: (6, -15)
Radius: 8

$(x-6)^2 + (y+15)^2 = 64$



hk
(0,3)
r = 3

$x^2 + (y-3)^2 = 9$



hk
(4, -3)
r = 2

$(x-4)^2 + (y+3)^2 = 4$

Use completing the square to find the radius and center of each of the following:

$x^2 + 6x + y^2 - 10y - 78 = 0$

Center: (-3,5) radius: 10.58

$x^2 - 14x + y^2 + 6y = 63$

Center: (7,-3) radius: 11

$x^2 + 8x + y^2 + 16y + 48 = 0$

$x^2 + 8x + 16 + y^2 + 16y + 64 = -48 + 16 + 64$

$(x+4)^2 + (y+8)^2 = 32$

center: (-4,-8) radius: $\sqrt{32}$

$x^2 - 12x + y^2 - 8y = -23$

Center: (6,4) radius: 5.39

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Name KEY Date ____________

Unit 6 Trig Functions Part II Test Review

1) Find an angle that is co-terminal with 852°.

(subtract or add 360 x times) possible answers: 492°, 132°, −228°

2) Find the smallest positive co-terminal with 705°.

345°

3) Identify the period and amplitude of $y = -4 \sin(2x)$.

period: $\frac{2\pi}{2} = \pi$ amplitude: 4

4) Identify the period, amplitude and any transformations of $y = -1/2 \cos(2x) - 4$.

period: $\frac{2\pi}{2} = \pi$ amplitude: $\frac{1}{2}$ phase shift: Ø vert. shift: ↓4

5) Without the use of technology, explain why cos 240° = cos 120°.

both have a reference angle of 60° which makes cos $= \frac{1}{2}$ + since they are in Quadrants II & III, both cosines are negative.

6) Without the use of technology, explain why sin 52° = sin 412°.

52° + 412° are coterminal

7) You have probably noticed that when you ride a Ferris Wheel, the distance from the ground varies sinusoidally with time. When the last seat is filled and the Ferris wheel starts, your seat is at the position in the figure below. Let *t* be the number of seconds that have elapsed since the Ferris wheel started. You find that it takes you four seconds to reach the top, 43 feet above the ground, and that the wheel makes a revolution every eight seconds. The diameter of the wheel is 40 feet.

This is always my first thought ☺

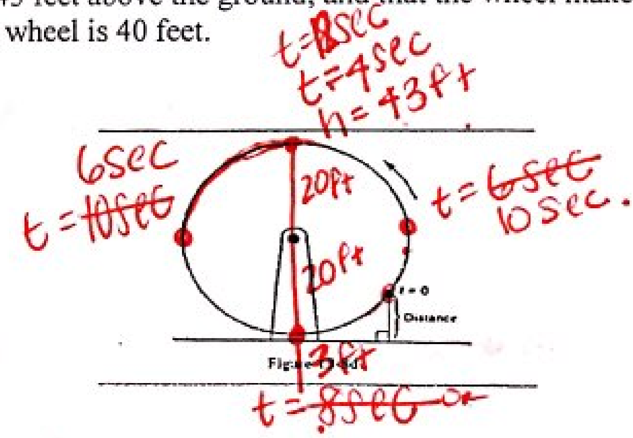
a) Write an equation to model this situation.

$y = 20\cos\frac{\pi}{4}(x-4) + 23$

b) Identify the period of the function and the amplitude.

period: ~~20~~ 8

amp: 20



c) Predict the height above the ground when: $t = 6$, $t = 9$, and $t = 0$.

23ft ~~8.86~~ 8.86ft 3ft (?)

max: 43ft

midline: 23ft

min: 3ft

amp: 20

period: 8

$\frac{2\pi}{b} = 8$ $b = \frac{2\pi}{8} = \frac{\pi}{4}$

8) A buoy bobbing up and down in the water as waves passes, it moves from its highest point to its lowest point, and back to its highest point every 10 seconds. The distance between the highest and lowest points is three feet.

a) Determine the amplitude and period of sinusoidal function that models the bobbing buoy.

amp: 1.5ft period: 10 sec.

b) Write an equation of a sinusoidal function that models the bobbing buoy, using x = 0 as its highest point.

$1.5\cos\frac{\pi}{5}x + \boxed{?}$

$\frac{2\pi}{b} = 10$

$\frac{2\pi}{10} = b$

$\frac{\pi}{5} = b$

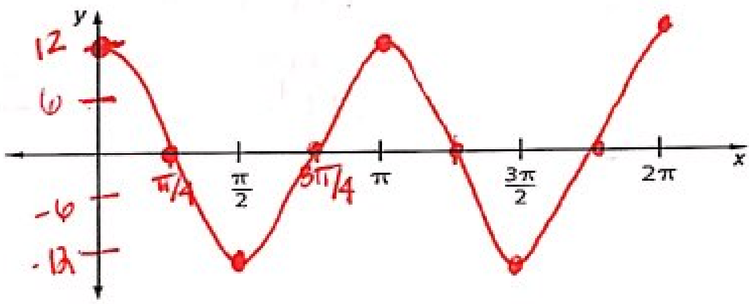
c) Find the height of the buoy after 15 seconds.

lowest point.

9) A function rule in the form $y = a\cos(bx)$ has period π and the distance between the highest and lowest point is 24.

a) Find a and b. $a = 12$
$b = 2$

b) Graph the function in Part a. Mark the scale on the y-axis.



c) Change one number in the above function rule so the period is 2π. Write the new rule.

$b=1$ $y = 12\cos x$

d) Sketch the new graph.