

Algebra III
Chapter 7
REVIEW

Name KEY
Date _____

Answer each of the following.

1. Convert 320° to radians. Give your answer in terms of π .

$$320 \cdot \frac{\pi}{180} = \boxed{\frac{16\pi}{9}}$$

2. Convert $\frac{11\pi}{15}$ to degrees.

$$\frac{11\pi}{15} \cdot \frac{180}{\pi} = \boxed{132^\circ}$$

3. Convert 2.32 radians to degrees. Give your answer to the nearest minute.

$$2.32 \cdot \frac{180}{\pi} = 132.926$$

.926(60)

$$\boxed{132^\circ 56'}$$

minutes
54-56

4. Convert 46.62° to the nearest second.

$$.62(60) = 37.2$$

$$.2(60) = 12$$

$$\boxed{46^\circ 37' 12''}$$

5. Find two angles, one positive and one negative, that are coterminal with each angle.

a. 520° 880°

-360

$$\boxed{160^\circ \text{ or } -200^\circ}$$

b. $\frac{-3\pi}{7}$

$$\frac{-3\pi}{7} \pm \frac{14\pi}{7} = \boxed{\frac{11\pi}{7} \text{ or } \frac{-17\pi}{7}}$$

6. A sector of a circle has a radius of 4 cm and a central angle of 3.5 radians. Find its arc length and area.

$$s = r\theta$$

$$s = 4(3.5)$$

$$\boxed{s = 14 \text{ cm}}$$

$$K = \frac{1}{2}rs$$

$$= \frac{1}{2}(4)(14) = \boxed{28 \text{ cm}^2}$$

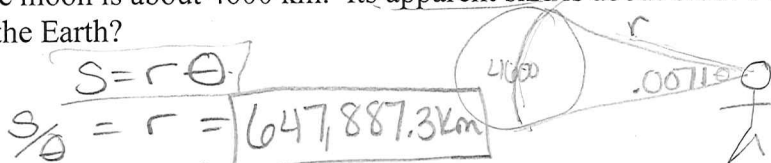
7. A circle has a central angle measuring 30° that intercepts an arc of 14 cm. Find the length of the radius of the circle.

$$14 = \frac{30}{360} 2\pi r$$

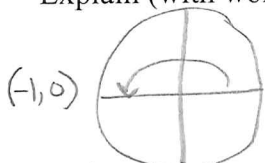
$$14 = .5236r$$

$$\boxed{r = 26.7 \text{ cm}}$$

8. The diameter of the moon is about 4600 km. Its apparent size is about 0.0071 radians. About how far is it from the Earth?



9. Explain (with words) why $\cot 180^\circ$ is undefined.



$\cot 180$ is at the coordinate $(-1, 0)$ and \cot is $x \div y$ which would be $-1/0 \therefore$ undefined.

10. Find ALL values of θ for which $\sin \theta = 1$.

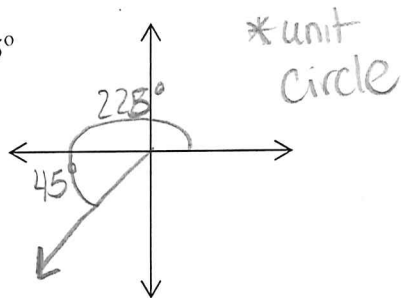


$$\theta = \frac{\pi}{2} \pm 2\pi n$$

11. Find the exact value of each of the following. Include a drawing with each answer.

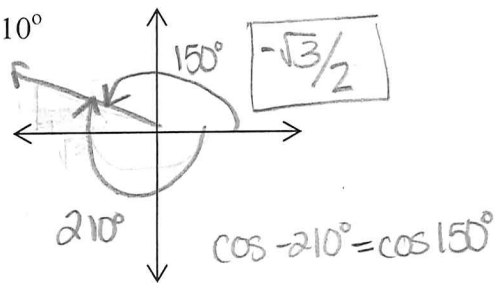
a. $\sin 225^\circ$

$$\frac{-\sqrt{2}}{2}$$



b. $\cos -210^\circ$

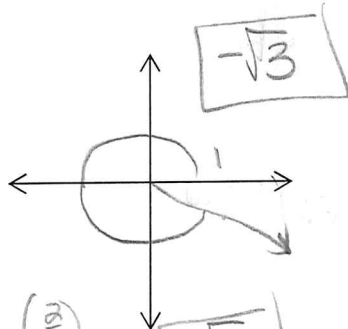
$$-\frac{\sqrt{3}}{2}$$



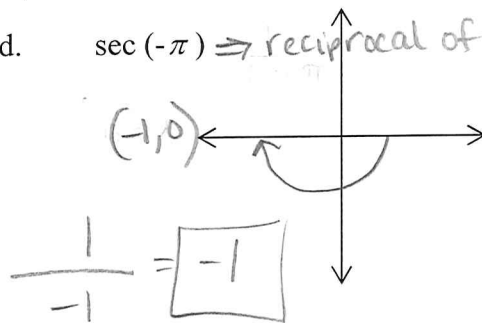
c. $\tan \frac{5\pi}{3}$

look @ unit circle

$$\tan = \frac{y}{x} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\sqrt{3}$$



d. $\sec(-\pi) \Rightarrow$ reciprocal of cosine



$$\frac{1}{-1} = -1$$

12. Use a calculator to find the value of each expression to four decimal places.

a) $\sin 158^\circ$

$$.3746$$

b) $\tan 35$

$$.7002$$

c) $\csc(-33^\circ)$

$$-1.5229$$

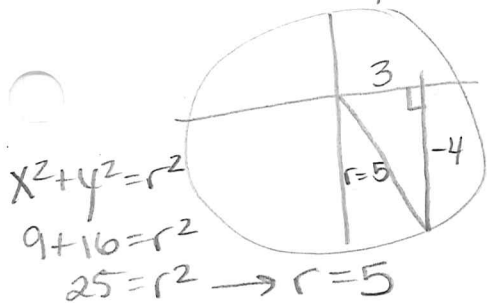
d) $\cot \frac{3\pi}{5}$

$$-\frac{1}{\tan} = -.3249$$

f) $\sec 30^\circ$

$$\frac{1}{\cos 30} = 1.1547$$

13. If $\cot \theta = -\frac{3x}{4y}$ and θ is a fourth quadrant angle, find the other five trigonometric values.



$$\cos \theta = \frac{3}{5}$$

$$\sec \theta = -\frac{5}{3}$$

$$\sin \theta = -\frac{4}{5}$$

$$\csc \theta = -\frac{5}{4}$$

$$\tan \theta = -\frac{4}{3}$$

14. Use your calculator to find each of the following to the nearest hundredth of a radian.

a. $\sin^{-1} .62$

$.67$

b. $\tan^{-1} (-0.3)$

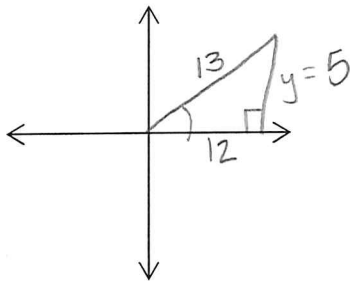
$-.29$

c. $\cos^{-1} 1.9$

\emptyset

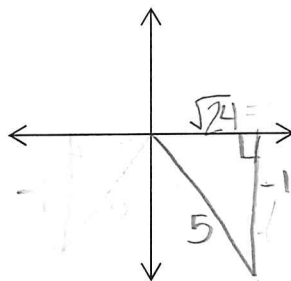
15. Find the exact value of each of the following. Include a drawing with each answer.

a. $\sin \left(\cos^{-1} \frac{12}{13} \right) = \frac{5}{13}$



$13^2 - 12^2 = 25 = y^2$

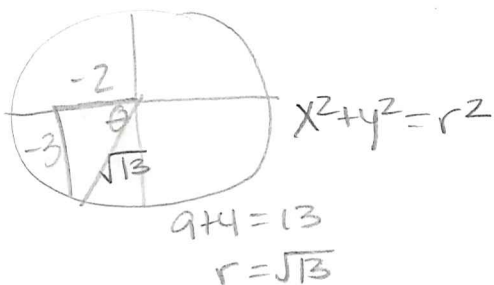
b. $\tan \left(\sin^{-1} -\frac{1}{5} \right) \rightarrow \sin \theta = -\frac{1}{5} = \frac{y}{r}$



$x^2 + y^2 = r^2$
 $x^2 + (-1)^2 = (5)^2$
 $x^2 + 1 = 25$
 $x^2 = 24$
 $x = \sqrt{24} = 2\sqrt{6}$

$\tan \theta = \frac{y}{x} = \frac{-1}{2\sqrt{6}} = \frac{-\sqrt{6}}{12}$

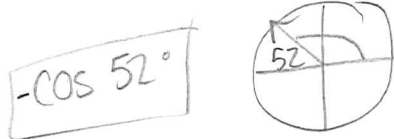
16. If the terminal side of an angle in standard position passes through $(-2, -3)$, find $\sin \theta$ and the $\cos \theta$.



$\cos \theta = \frac{-2\sqrt{13}}{13}$
 $\sin \theta = \frac{-3\sqrt{13}}{13}$

17. Express each of the following in terms of a reference angle.

a. $\cos 128^\circ$

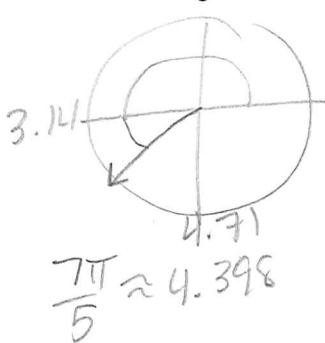


b. $\sec 242^\circ \frac{1}{\cos}$



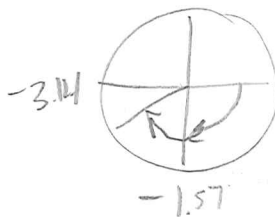
$-\sec 62^\circ$

c. $\sin \frac{7\pi}{5}$



$\frac{7\pi}{5} - \frac{5\pi}{5} = \frac{2\pi}{5}$

d. $\tan -1.6$



$\pi - 1.6 = 1.54$

$\tan 1.54$