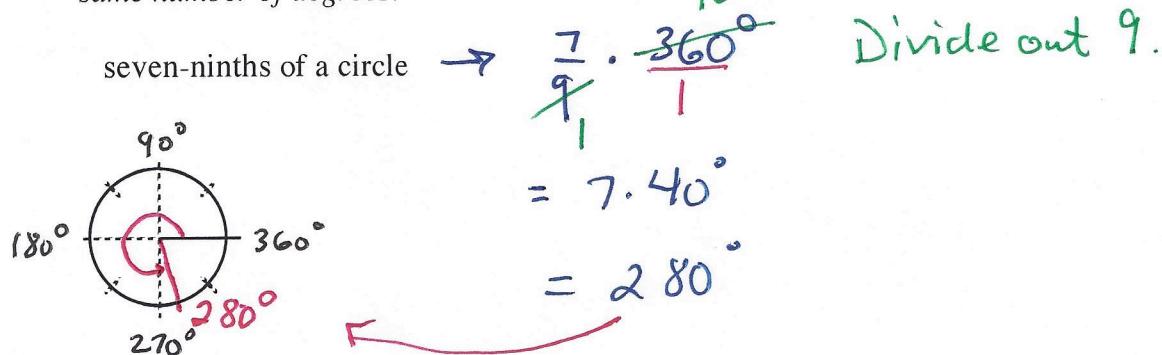


## Test 1 Pre-Test

Name \_\_\_\_\_

## Answers

1. What degree measure represents the given portion of a circle? Draw a central angle that has that same number of degrees.



2.  $\angle ABC$  and  $\angle XYZ$  are supplementary angles.

Given the measure of  $\angle ABC$ , find  $m\angle XYZ$ .

$180^\circ$  add to subtract

now we are ready to subtract:

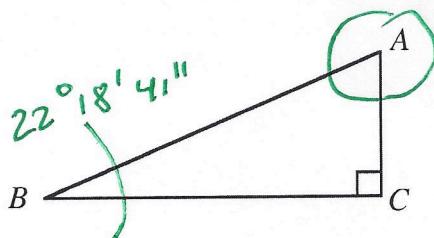
$$\begin{array}{r} 180^\circ 00' 00'' \\ - 102^\circ 28' 15'' \\ \hline 77^\circ 31' 45'' \end{array}$$

To subtract, we start at the seconds, but we must borrow (or beg or steal) from the  $180^\circ$ .

3. In  $\triangle ABC$ ,  $m\angle B = 22^\circ 18' 41''$ . Find  $m\angle A$ .

$\angle A$  and  $\angle B$  are complementary,

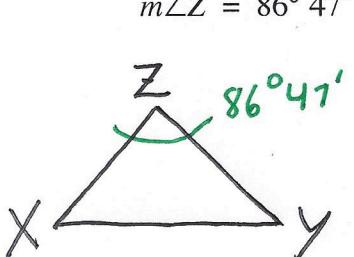
so subtract from  $90^\circ$ :



$$\begin{array}{r} 90^\circ 00' 00'' \\ - 22^\circ 18' 41'' \\ \hline 67^\circ 41' 19'' \end{array}$$

Draw this isosceles triangle.  $m\angle Z$  is about  $90^\circ$ . This will help us with our diagram.

4.  $\triangle XYZ$  is an isosceles triangle.  $\angle X$  and  $\angle Y$  are the congruent base angles. Given  $m\angle Z$ , find  $m\angle X$ .  
(Write the answer in DMS.)



STEPS: (i) subtract  $m\angle Z$  from  $180^\circ$

$$m\angle Z = 86^\circ 47'$$

(ii) divide by 2 to find  $m\angle X$ .

$$\begin{array}{r} (i) \quad 179^\circ 60' \\ - 86^\circ 47' \\ \hline 93^\circ 13' \end{array}$$

$$\begin{array}{r} (ii) \quad \frac{93^\circ 13'}{2} \\ \qquad \qquad \qquad \leftarrow \text{adjust to make degrees even. } 1^\circ = 60' \end{array}$$

$$\begin{array}{r} (ii) \quad \frac{92^\circ 73'}{2} \\ \qquad \qquad \qquad \leftarrow \text{adjust to make minutes even. } 1' = 60'' \end{array}$$

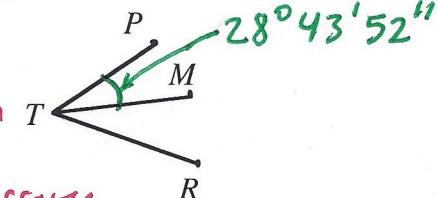
$$m\angle X = \frac{92^\circ 72' 60''}{2} = \boxed{46^\circ 36' 30''}$$

5. At right,  $\overline{TM}$  bisects  $\angle PTR$ .

- a) If  $m\angle PTM = 28^\circ 43' 52''$ , find  $m\angle PTR$ . (i) multiply  $m\angle PTM$  by 2  
 $m\angle PTR = 2 \cdot (28^\circ 43' 52'')$  (ii) adjust, if necessary

$$\begin{array}{r} = 56^\circ 86' 104'' \\ + 1' - 60'' \\ \hline 56^\circ 87' 54'' \\ + 1^\circ - 60' \\ \hline m\angle PTR = 57^\circ 27' 54'' \end{array}$$

adjust the seconds  
adjust the minutes

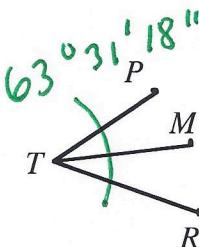


- b) If  $m\angle PTR = 63^\circ 31' 18''$ , find  $m\angle PTM$ .

Divide by 2 by first making the degrees and minutes even numbers:

$$\begin{array}{r} m\angle PTM = \frac{63^\circ 31' 18''}{2} \quad \text{adjust the degrees } 1^\circ = 60' \\ = \frac{62^\circ 91' 18''}{2} \quad \text{adjust the minutes } 1' = 60'' \\ = \frac{62^\circ 90' 78''}{2} \quad \text{now divide by 2} \end{array}$$

$$m\angle PTM = \boxed{31^\circ 45' 39''}$$



6. Consider a circle centered at the origin that passes through  $(-4, 2\sqrt{5})$ .

Note:  $2\sqrt{5} \approx 4.5$

- a) Find the radius of the circle

$$r^2 = x^2 + y^2$$

$$r^2 = (-4)^2 + (2\sqrt{5})^2$$

$$r^2 = 16 + 4 \cdot 5$$

$$r^2 = 16 + 20$$

$$r^2 = 36$$

$$\boxed{r = 6}$$

- b) Draw its graph.

- (i) Use  $r=6$  to find the four axial points.  
 (ii) plot  $(-4, 2\sqrt{5})$ ; use symmetry to find points in other quadrants.  
 (iii) plot inverted ordered pair  $(2\sqrt{5}, 4)$  in Quad I, then use symmetry for other quadrants.

- c) What is the equation of the circle?

$$x^2 + y^2 = r^2 \rightarrow \boxed{x^2 + y^2 = 36}$$

Verify that the given point is on the unit circle. Equation  $\rightarrow x^2 + y^2 = 1$

7.  $(-\frac{5\sqrt{3}}{9}, \frac{\sqrt{6}}{9})$  is this on the unit circle?

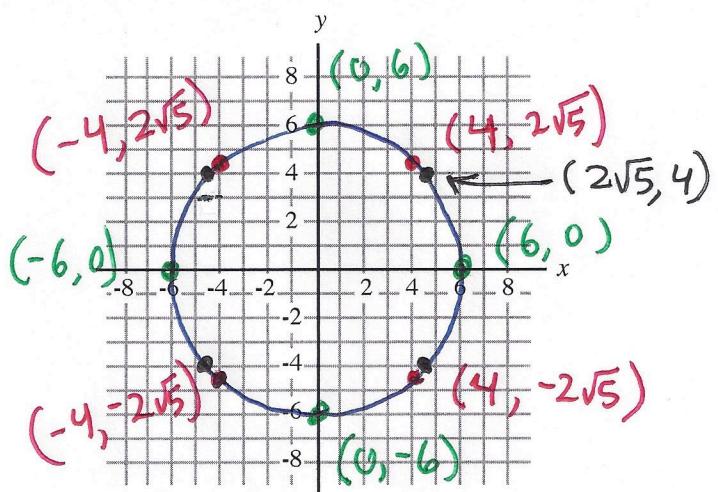
$$(-\frac{5\sqrt{3}}{9})^2 + (\frac{\sqrt{6}}{9})^2 ?= 1$$

$$\frac{25 \cdot 3}{81} + \frac{6}{81} ?= 1$$

$$\frac{75}{81} + \frac{6}{81} ?= 1$$

$$\frac{81}{81} = 1$$

true ✓



Use the identity  $\sin\theta = \pm \sqrt{1 - \cos^2\theta}$  to find  $\sin\theta$ .

8.  $\cos\theta = -\frac{\sqrt{5}}{3}$  and  $\theta$  terminates in QIII. sin\theta is neg. in QIII

$$\sin\theta = -\sqrt{1 - (-\frac{\sqrt{5}}{3})^2}$$

$$= -\sqrt{1 - \frac{5}{9}}$$

$$= -\sqrt{\frac{9}{9} - \frac{5}{9}}$$

$$= -\sqrt{\frac{4}{9}}$$

$$\boxed{\sin\theta = -\frac{2}{3}}$$