Exercise 2: The Unit Circle (continued)

6. $x^2+y^2=1$

$(5/13)^2+y^2=1$

$y^2=1-25/169$

$y^2=\frac{144}{169}$

$y=\pm\frac{12}{13}$

since the point is in Quad IV

$y=-\frac{12}{13}$

7. $x^2+y^2=1$

$x^2+(8/17)^2=1$

$x^2=1-64/289$

$x^2=\frac{225}{289}$

$x=\pm\frac{15}{17}$

since the point is in Quad II

$\cos\theta=\frac{-15}{17}$

8. $\tan\theta=\frac{\sin\theta}{\cos\theta}$

$\tan\theta=\frac{-\sqrt{10}/4}{\sqrt{6}/4}$

$=\frac{-\sqrt{10}}{\sqrt{6}}=\frac{-\sqrt{60}}{6}$

$=\frac{-2\sqrt{15}}{6}=\frac{-\sqrt{15}}{3}$

9. $x^2+y^2=1$ – Equation of unit Circle

$\left(\frac{\sqrt{5}}{5}\right)^2+\left(\frac{2\sqrt{5}}{5}\right)^2=\frac{5}{25}+\frac{20}{25}$

$=\frac{25}{25}=1$

$\therefore$ Yes $\left(\frac{\sqrt{5}}{5},\frac{2\sqrt{5}}{5}\right)$ is on the unit circle

10. $C=2\pi r$

$30=2\pi r \Rightarrow r=15/\pi$

$s=\theta r$

$5=\theta\left(\frac{15}{\pi}\right)$

$\theta=\frac{\pi}{3}$ radians $=60°$

11. since $s=\theta r$ and $A=\pi r^2$,

$A=\frac{\pi s^2}{\theta^2}$

$\theta=30°$ or $\pi/6$ radians

$A=\frac{\pi(7.6)^2}{(\pi/6)^2}=661.9\text{cm}^2$ (area of circle)

The slice would be $1/12$th $[30°/360°]$ of the pie.

$\therefore$ Area of the slice $=\frac{661.9}{12}=55.2\text{cm}^2$

12. Students could explain:

- division of the unit circle
- how to determine if greater than one revolution
- values of each quadrantal angle
- approximate and/or exact values.