**Conic Sections in Polar Coordinates homework**

1. Explain how eccentricity determines which conic section is given.
2. If a conic section is written as a polar equation, what must be true of the denominator?
3. If a conic section is written as a polar equation, and the denominator involves $\sin(θ)$, what conclusion can be drawn about the directrix?
4. If the directrix of a conic section is perpendicular to the polar axis, what do we know about the equation of the graph?
5. What do we know about the focus/foci of a conic section if it is written as a polar equation?
6. For the following exercises, identify the conic with a focus at the origin, and then give the directrix and eccentricity.
	1. $r=\frac{6}{1-2\cos(θ)},$
	2. $r=\frac{3}{10+10\cos(θ)},$
	3. $r=\frac{3}{4-4\sin(θ)},$
	4. $r=\frac{5}{1+2\sin(θ)}$.
7. For the following exercises, convert the polar equation of a conic section to a rectangular equation.
	1. $r=\frac{3}{2+5\cos(θ)},$
	2. $r=\frac{3}{8-8\cos(θ)},$
	3. $r=\frac{5}{5-11\sin(θ)},$
	4. $r\left(6-4 cosθ\right)=5.$
8. For the following exercises, find the polar equation of the conic with focus at the origin and the given eccentricity and directrix.
	1. Directrix:  $x=4$;$e=\frac{1}{5}$,
	2. Directrix:  $x=\frac{2}{5}$;$e=\frac{7}{2},$
	3. Directrix:  $x=-2$;$e=\frac{8}{3}$,
	4. Directrix:  $y=-2$;$e=\frac{1}{2}.$