1. Find a Cartesian equation of the curve: 
   \[ x(t) = \sqrt{t} \]
   \[ y(t) = 1 - t \]

2. Find an equation of the tangent to the curve at the point corresponding to the given value of the parameter:
   \[ x(t) = t \cos(t) \]
   \[ y(t) = t \sin(t) \]
   \[ t = \pi \]

3. Find the area under the curve for the values \( \frac{\pi}{6} \leq \theta \leq \frac{5\pi}{6} \):
   \[ x(\theta) = 3(\theta - \sin(\theta)) \]
   \[ y(\theta) = 3(1 - \cos(\theta)) \]
4. Find the length of the curve for the values of the parameter $t$: $x(t) = \sin(t)$, $y(t) = \cos(t)$
\[
\frac{\pi}{4} \leq t \leq \frac{3\pi}{4}
\]

5. Find the surface area for the curve for the given values of the parameter. The curve is $x(t) = \cos(t)$ revolved around the x-axis. $y(t) = \sin(t)$
\[
\frac{\pi}{6} \leq t \leq \frac{\pi}{3}
\]

6. Find cartesian coordinates for the point $P$ whose polar coordinates are $(-\sqrt{2}, -\frac{3\pi}{4})$

7. Find the 2 different polar coordinates for the point $P$ whose Cartesian coordinates are $(-1, \sqrt{3})$
8. Find the slope of the tangent line to the given polar curve at the point specified by the value 
   \[ r(\vartheta) = \cos(2\vartheta) \]
   of \( \vartheta \).
   \[ \vartheta = \frac{\pi}{4} \]

9. Find the area of the region under the curve from \( \frac{\pi}{6} \leq \vartheta \leq \pi \) \( r(\vartheta) = 1 - \sin(\vartheta) \)

10. Find the length of the polar curve for \( 0 \leq \vartheta \leq \frac{3\pi}{4} \) \( r(\vartheta) = 2\cos(\vartheta) \)
11. Find a polar equation \( r \) for the conic with its focus at the pole. (For convenience, the equation for the directrix is given in rectangular form.)

<table>
<thead>
<tr>
<th>Conic</th>
<th>Eccentricity</th>
<th>Directrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperbola</td>
<td>( e = 6 )</td>
<td>( x = 2 )</td>
</tr>
</tbody>
</table>

12. Find a polar equation \( r \) for the conic with its focus at the pole. (For convenience, the equation for the directrix is given in rectangular form.)

<table>
<thead>
<tr>
<th>Conic</th>
<th>Eccentricity</th>
<th>Directrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellipse</td>
<td>( e = 0.7 )</td>
<td>( y = 5 )</td>
</tr>
</tbody>
</table>

13. Find a polar equation \( r \) for the conic with its focus at the pole. (For convenience, the equation for the directrix is given in rectangular form.)

<table>
<thead>
<tr>
<th>Conic</th>
<th>Eccentricity</th>
<th>Directrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parabola</td>
<td>( e = 1 )</td>
<td>( x = -8 )</td>
</tr>
</tbody>
</table>