1. Follow the directions.
   a. Draw a ray that starts at point \( L \) at \((1 \frac{1}{2}, 3)\) and includes point \( K \) at \((5, 3)\). Label points \( K \) and \( L \).
   
   b. Give the coordinates of three other points on the ray.
   
   c. Draw a second ray with the same initial point and containing point \( M \) with coordinates \((3 \frac{1}{2}, 4 \frac{3}{4})\). Label point \( M \).

2. David draws a line segment from point \( Q \) \((\frac{1}{4}, \frac{7}{8})\) to point \( R \) \((\frac{5}{8}, \frac{1}{2})\). He then draws a line perpendicular to the first segment that intersects segment \( QR \) and includes point \( S \) \((\frac{2}{3}, 1)\).
   a. Draw \( QR \), and label the endpoints on the grid.
   
   b. Draw the perpendicular line, and label point \( S \).
   
   c. Name another point that lies on the perpendicular line whose \( x \)-coordinate is between 1 and \( 1 \frac{1}{2} \).
3. Complete the table for the rule *multiply by 2 and then add 2* for the values of $x$ from 0 to 4. Then, use the coordinate plane to answer the questions.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
<th>($x$, $y$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Which line shows the rule in the table?

b. Give the coordinates for the intersection of lines $b$ and $c$.

c. Draw a line on the graph such that any point on the line has a $y$-coordinate of 2. Label your line as $e$.

d. Which coordinate is 2 for any point on line $c$?
e. Write a rule that tells how to find the $y$-coordinate when the $x$-coordinate is given for the points on line $\ell$.

f. Kim and Lacy want to draw a line on the coordinate plane that is parallel to line $a$. Kim uses the rule $\text{multiply by 4 and add 2}$ to generate her $y$-coordinates. Lacy uses the rule $\text{multiply by 2 and add 4}$ to generate her $y$-coordinates. Which girl’s line will be parallel to line $a$? Without graphing the lines, explain how you know.

4. An airplane is descending into an airport. When its altitude is 5 miles, it is 275 miles from the airport. When its altitude is 4 miles, it is 200 miles from the airport. At 3 miles, it is 125 miles from the airport.

a. If the pilot follows the same pattern, what will the plane’s altitude be at 50 miles from the airport?

b. For the plane to land at the airport, the altitude will need to be 0, and the distance from the airport will need to be 0. Should the pilot continue this pattern? Why or why not?