1. Let \( \mathcal{L} \) be the line that passes through \((-3, 8)\) and is parallel to the line \(x + 2y = -6\).

Let \( \mathcal{M} \) be the line that passes through \((-3, 8)\) and is perpendicular to the line \(x + 2y = -6\).

Fill in the following:

<table>
<thead>
<tr>
<th>Line</th>
<th>Slope</th>
<th>( y ) intercept</th>
<th>( x ) intercept</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \mathcal{L} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \mathcal{M} )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( \mathcal{L} \)'s equation in slope-intercept form: __________________  
\( \mathcal{M} \)'s equation in slope-intercept form: __________________

Sketch the graph of the lines \( \mathcal{L} \) and \( \mathcal{M} \)

2. Give an explicit (piecewise) definition of the function \( f(x) \) shown below, then on the same graph sketch \( y = -f(-x) \)

3. Write an equation of a circle of radius 8 centered at \((-12, 11)\).
4. Solve and graph the solution set of the inequality \(2x^2 + 5x \leq 3x^2 + 2x - 10\).

5. Given \(f(x) = 2x^2 - 5x + 6\) and \(g(x) = x^4\) evaluate the following:
   a) \(f(1)\) = ________________
   b) \(f(f(1))\) = ________________
   c) \(g(2x)\) = ________________
   d) \((f \circ g)(x)\) = ________________

6. A rectangle is 3 m longer than it is wide and has an area of 180 m\(^2\). What are the rectangle's dimensions?

7. A storage tank has two inlet pipes. The smaller pipe takes 16 minutes longer by itself to fill the tank than does the larger inlet. When both pipes are open the tank fills in 15 minutes. How long does it take the large inlet pipe acting alone to fill the tank?

8. For the function \(f(x) = - (x - 2)^2 + 5\) state the domain and the range and then sketch \(y = f(x)\).