1) Examine the linear graph. Find the y-intercept, slope, and write the equation in slope-intercept form (y=mx+b).

y-intercept – (0, 100)  
Slope - \( \frac{8}{7} \)  
Equation (y=mx+b) : \( y = \frac{8}{7}x + 100 \)

2) The table below represents a linear relation. Find the y-intercept, slope, and write the equation in slope-intercept form (y=mx+b).

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>144</td>
</tr>
<tr>
<td>24</td>
<td>172</td>
</tr>
<tr>
<td>28</td>
<td>200</td>
</tr>
<tr>
<td>32</td>
<td>228</td>
</tr>
<tr>
<td>36</td>
<td>256</td>
</tr>
</tbody>
</table>

y-intercept – 4  
Slope - 7  
Equation (y=mx+b) : \( y = 7x + 4 \)

Write the slope-intercept from of the equation of the line through the given point with the given slope.

3) through (1, 2), slope = 7

\[ y = 7x + b \]
\[ 2 = 7(1) + b \]
\[ 2 = 7 + b \]
\[ -5 = b \]

Ans: \( y = 7x - 5 \)

4) through (3, -1), slope = -1

\[ y = -1x + b \]
\[ -1 = -1(3) + b \]
\[ -1 = -3 + b \]
\[ 2 = b \]

Ans: \( y = -x + 2 \)

5) through (-2, 5), slope = -4

\[ y = -4x + b \]
\[ 5 = -4(-2) + b \]
\[ 5 = 8 + b \]
\[ -3 = b \]

Ans: \( y = -4x - 3 \)

6) through (3, 5), slope = \( \frac{5}{3} \)

\[ y = \frac{5}{3}x + b \]
\[ 5 = \frac{5}{3}(3) + b \]
\[ 5 = \frac{15}{3} + b \]
\[ 5 = 5 + b \]
\[ 0 = b \]

Ans: \( y = \frac{5}{3}x \)
Write the slope-intercept form of the equation of the line through the given two points. (hint: find the slope first)

7) through (0, 3) and (-4, -1)
\[ m = \frac{-1 - 3}{-4 - 0} = \frac{-4}{-4} = 1 \]
\[ y = mx + b \]
\[ 3 = 1(0) + b \]
\[ b = 3 \]
\[ y = x + 3 \]

Ans: \( y = x + 3 \)

8) through (0, 2) and (1, -3)
\[ m = \frac{-3 - 2}{1 - 0} = \frac{-5}{1} \]
\[ y = mx + b \]
\[ -3 = 1(0) + b \]
\[ b = -3 \]
\[ y = -5x + 2 \]

Ans: \( y = -5x + 2 \)

9) through (-4, 0) and (1, 5)
\[ m = \frac{5 - 0}{1 - (-4)} = \frac{5}{5} = 1 \]
\[ y = mx + b \]
\[ 0 = 1(-4) + b \]
\[ b = 4 \]
\[ y = x + 4 \]

Ans: \( y = x + 4 \)

10) through (0, -1) and (-2, -1)
\[ m = \frac{-1 - (-1)}{-2 - 0} = \frac{0}{-2} = 0 \]
\[ y = 0x + b \]
\[ -1 = 0(0) + b \]
\[ b = -1 \]
\[ y = -1 \]

Ans: \( y = -1 \)

11) through (5, 3) and (4, 5)
\[ m = \frac{5 - 3}{4 - 5} = \frac{2}{-1} = -2 \]
\[ y = mx + b \]
\[ 3 = -2(5) + b \]
\[ b = 13 \]
\[ y = -2x + 13 \]

Ans: \( y = -2x + 13 \)

12) through (-3, 5) and (-3, 4)
\[ m = \frac{4 - 5}{-3 - (-3)} = \frac{-1}{0} \]
\[ m = \text{undefined} \rightarrow \text{vertical line} \]
\[ x = -3 \]

Ans: \( x = -3 \)