For each of the following:

a. Determine whether each is a function.  
b. State the domain.  
c. State the range.

1.

1a.  
1b.  
1c.  

2.

2a.  
2b.  
2c.  

3.

3a.  
3b.  
3c.  

4.

4a.  
4b.  
4c.  

5.

5a.  
5b.  
5c.  

6.

6a.  
6b.  
6c.  

7.

7a.  
7b.  
7c.  

8.

8a.  
8b.  
8c.  

9.

9a.  
9b.  
9c.
10. \{(3,4),(2,4),(-6,4)\}  
11. \{(-1,2),(1,-2),(2,1),(-2,-1)\}  
12. \{(-5,4),(-5,-8),(-5,10)\}  

10a. ___________________  
11a. ___________________  
12a. ___________________  

10b. ___________________  
11b. ___________________  
12b. ___________________  

10c. ___________________  
11c. ___________________  
12c. ___________________  

Find the range of each function when the domain is \{-1, 0.5, 3.7\}. Show your work!!!

13. \(f(x) = 4x + 1\)  
14. \(g(x) = -4x + 8\)  
15. \(h(w) = w^2 + |w|\)  

R: ___________________  
R: ___________________  
R: ___________________  

Determine if each relation is a function. If it is a function, state the domain and the range.

16.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>6</td>
<td>-2</td>
</tr>
<tr>
<td>9</td>
<td>-1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

YES NO

17.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>-1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

YES NO

18.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>0</td>
<td>-4</td>
</tr>
<tr>
<td>3</td>
<td>-4</td>
</tr>
</tbody>
</table>

YES NO

D: ___________________  
D: ___________________  
D: ___________________  

R: ___________________  
R: ___________________  
R: ___________________  

19. Light travels about 186,000 miles per second. The rule \(d = 186,000t\) describes the relationship between the distance \(d\) in miles and time \(t\) in seconds.

a. How far does light travel in 20 seconds?  

b. How far does light travel in 1 minute?  

C. How long does it take light to travel 20,000,000 miles?
For each of the following:

a. Determine whether each is a function.  
   b. State the domain.  
   c. State the range.

1.  
   1a. __Yes__  
   1b. $\mathbb{R}$ ($-\infty, \infty$)  
   1c. $(-\infty, 5]$  

2.  
   2a. __No__  
   2b. $(-\infty, -2]$  
   2c. $(-\infty, \infty)$  

3.  
   3a. __Yes__  
   3b. $(-\infty, \infty)$  
   3c. $(-\infty, 8]$  

4.  
   4a. __No__  
   4b. $(-\infty, \infty)$  
   4c. $(-\infty, \infty)$  

5.  
   5a. __No__  
   5b. $[-6, 3]$  
   5c. $\{1, 3, 5\}$  

6.  
   6a. __No__  
   6b. $[-5, 5]$  
   6c. $[-7, 7]$  

7.  
   7a. __Yes__  
   7b. $(-\infty, \infty)$  
   7c. $[-5, \infty)$  

8.  
   8a. __Yes__  
   8b. $[-5, \infty)$  
   8c. $[0, \infty)$  

9.  
   9a. __No__  
   9b. $[-3, 7]$  
   9c. $[-6, 5]$
10. \{(3,4),(2,4),(-6,4)\}  
11. \{(-1,2),(1,-2),(2,1),(-2,-1)\}  
12. \{(-5,4),(-5,-8),(-5,10)\}  
10a. \text{YES}  
11a. \text{YES}  
12a. \text{NO}  
10b. \{-6,2,3\}  
11b. \{-2,-1,1,2\}  
12b. \{-5\}  
10c. \{4\}  
11c. \{-2,-1,1,2\}  
12c. \{-8,4,10\}  

Find the range of each function when the domain is \{-1, 0.5, 3.7\}. Show your work!!

13. \(f(x) = 4x + 1\)  
14. \(g(x) = -4x + 8\)  
15. \(h(w) = w^2 + |w|\)  

\[
R: \{-3, 3, 15.8\} \\
R: \{-6.8, 6, 12\} \\
R: \{0.75, 2, 17.39\}
\]

Determine if each relation is a function. If it is a function, state the domain and the range.

16.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>6</td>
<td>-2</td>
</tr>
<tr>
<td>9</td>
<td>-1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

D: \__________
R: \__________

17.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>-1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

D: \__________
R: \__________

18.  
<table>
<thead>
<tr>
<th>(x)</th>
<th>(y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>-1</td>
<td>-4</td>
</tr>
<tr>
<td>0</td>
<td>-4</td>
</tr>
<tr>
<td>3</td>
<td>-4</td>
</tr>
</tbody>
</table>

D: \{-4, -1, 0, 3\}
R: \{-9, -4\}

19. Light travels about 186,000 miles per second. The rule \(d = 186,000t\) describes the relationship between the distance \(d\) in miles and time \(t\) in seconds.

a. How far does light travel in 20 seconds?

\(3,720,000\) miles

b. How far does light travel in 1 minute?

\(11,160,000\) miles

c. How long does it take light to travel 20,000,000 miles?

\(107.5\) sec
\(\approx 1.79\) min