1. Given that \( f(x) = 2x^2 - 1 \), \( g(x) = 2x + 3 \), and \( h(x) = \frac{1}{x - 1} \), find and simplify

(a) \( 4h(3) + 2[g(2)]^2 \)

(b) \( \frac{(g \circ f)(-2)}{(f \circ f)(-1)} \)

(c) \( \frac{f(3 + h) - f(3)}{h} \)

(d) \( \frac{h(x + a) - h(x)}{a} \)

2. A thin piece of copper wire 20 inches in length is to be cut into two parts. From one part, a square will be made; from the other, a circle. Let \( x \) = the length of the side of the square.

(a) Suppose \( A \) is the function \( A(x) = \) sum of the areas of the two figures. Determine the formula for \( A \) in terms of \( x \).

(b) Determine the domain of this function.

3. Suppose you earn an A− in this class from your homework, classwork, quizzes, exams, and final. Let \( G(a) \) be your final reported grade in this class if you had \( a \) absences. This class will meet 72 times.

(a) We can present \( G(a) \) as a table of values. Fill in the table below.

<table>
<thead>
<tr>
<th>( a )</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>( G(a) )</td>
<td>A−</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) What is the domain of \( G(a) \)?
What is the range of \( G(a) \)?
What is the value of \( G(7) \)?
What is the value of \( G(-1) \)?

4. Find the domain of the given functions. Are the functions even, odd, or neither?

(a) \( f(x) = \frac{x^2 + 4}{x^4 - 2} \)

(b) \( g(y) = \sqrt{2y + 5} + 1 \)
(c) \( h(x) = \begin{cases} 
1 & : x > 0 \\
13 & : x = 0 \\
-1 & : x < 0 
\end{cases} \)

(d) \( f(x) = \frac{4x^3 + x}{4 + 3x^2} \)

5. Graph the following

(a) \( y = 5 - x^2 \)

(b) \( y = 3\sqrt{x} \)

(c) \( y = (x + 2)^3 - 1 \)

(d) \( y = \frac{1}{x-1} \)

6. Give the formula of a rational function \( f \) such that the graph of \( f \) has asymptotes of \( x = -1 \), \( x = 2 \), and \( y = 3 \), and satisfies \( f(1) = -2 \) and \( f(3) = 6 \). Graph your function, labeling intercepts and asymptotes.