Chapter 3
Practice Test

Directions: Determine whether each function is even, odd, or neither. Explain.
1. \( y = 3x^4 - 6x^2 + 2 \)  
2. \( y = 10x^{12} - 7x^3 + 1 \)

Directions: The graphs below are portions of completed graphs. Sketch a completed graph showing the symmetry requested.
3. Symmetry about the x-axis
4. Symmetry about the origin

Directions: State whether each of the following functions is even, odd, or neither. Explain.
5. 
6. 
7. 
8. 

Directions: Solve the following problems. Show your work.
9. Where does the graph of \( y = \frac{x^{17}}{x^2 + 6x + 4} \) touch the x-axis?
10. What is the horizontal asymptote of \( y = \frac{-2x^2 + 5x + 4}{3x^{12} + 14x} \)?

**Directions:** Find the inverse of each function below.

<table>
<thead>
<tr>
<th>f(x)</th>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>y</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>8</td>
<td></td>
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<tr>
<td>23</td>
<td>3</td>
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</tbody>
</table>

11. 12. \( y = \frac{x}{x - 3} \)

13. 

**Directions:** Consider \( y = f(x) \) shown at the right. On the grids provided, sketch the shift requested.

14. 15. 

16. 17. 

\( y = -f(x) \)  \( y = |f(x)| \)  \( y = w(-x) \)  \( y = w(|x|) \)
18. Find the inverse of \( y = (x \cdot 2)^3 + 4 \).

**Directions:** On a separate sheet of graph paper sketch each function. Make sure you number and label each graph. Plot at least 2 points for accuracy.

19. \( y \geq -4x + 2 \)  
20. \( y < 3|x + 2| - 1 \)

21. \( y = x^3 + 2 \)  
22. \( y = -(x + 1)^2 + 6 \)

23. \( y = \frac{3x - 2}{x - 1} \)  
24. \( y = \frac{x^2 - 25}{x - 5} \)

25. \( y = \left| \frac{-3}{x^2 - 8x + 16} \right| \)  
26. \( y = -|x^2 - 4| \)

27. Let \( f(x) = \begin{cases} 1 & \text{if } x < 0 \\ x & \text{if } 0 < x < 4 \\ \sqrt{x + 4} & \text{if } x \geq 4 \end{cases} \)  

Graph \( f(x) \), \(-f(x)\), \(f(-x)\), \(|f(x)|\), and \(|f(|x|)|\).