Find the domain, range and asymptotes of the following graphs.

For each problem (#3-5) complete the following:

1. **Domain**
2. **Y-intercept**
3. **X-intercepts**
4. **Vertical asymptotes**
5. **Horizontal or oblique asymptotes**
6. **X/y chart**
7. **Graph the rational function**

### Problem 3

\[ R(x) = \frac{x-1}{x^2 + x - 6} \]
4. \( f(x) = \frac{2x}{x^2 - x - 6} \)

5. \( f(x) = \frac{3x^2}{x^2 - 4} \)

On problems 6-8 answers may vary.

6. Give a rational function that could be an equation of the possible graph.

7. Write the equation of a polynomial that fulfills all of the following criteria: It has real zeros at \( x = 4, x = -1, x = 0 \) and \( x = 9 \). The polynomial also has degree 9 and the graph of the function crosses the x-axis at \( x = -1 \) and \( x = 9 \) and touches the x-axis at \( x = 0 \).

8. Write a rational function that has asymptotes \( y = 4 \) and \( x = 3 \) and an x-intercept of 12.