Section 4.1 Supplemental Worksheet Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Identify the domain, vertical asymptotes, horizontal asymptotes, zeros and holes for the following rational functions.

1. $f\left(x\right)=\frac{x^{2}+3x}{x^{2}+x-6}$ 2. $f\left(x\right)=\frac{5x+20}{x^{2}+x-12}$
2. $f\left(x\right)=-\frac{x^{2}-1}{x^{2}+4}$ 4. $f\left(x\right)=\frac{x^{2}-5x+4}{x^{2}-4}$

5. $f\left(x\right)=\frac{2x^{2}-5x+2}{2x^{2}-x-6}$ 6. $f\left(x\right)=\frac{1}{x+5}+\frac{4}{x}$

Find a rational function with the specified characteristics.

1. Vertical Asymptote: x = 2 8. Vertical Asymptotes: x = -1, x = 2

Horizontal Asymptote: y = 0 Horizontal Asymptote: y = -2

Zero: x = 1 Zeros: x =- 2, x = 3

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