

## Graphing Rational Functions - WKST 2 (Revised)

I. Sketch the graph of each function.

$$1. \ g(x) = \frac{5x}{2x+3}$$

$$2. \ h(x) = \frac{2x}{x^2 - 9}$$

$$3. \ f(x) = \frac{x^2}{x-1}$$

$$4. \ y = \frac{2x^2}{x^2 - 9}$$

$$5. \ y = \frac{2x^2 - x - 10}{x + 2}$$

$$6. \ g(x) = \frac{6}{x^2 + 1}$$

$$7. \ y = \frac{x-6}{x^2 - 36}$$

II. State the domain. Then use a graphing calculator to find the range.

$$8. \ y = \frac{3x^2}{x^2 - 9}$$

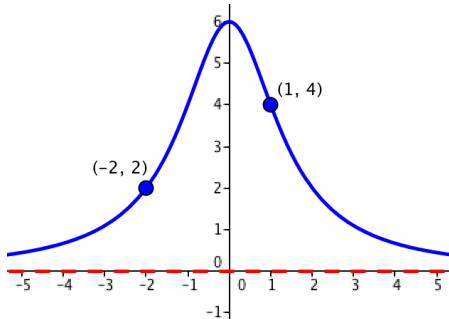
$$9. \ f(x) = \frac{x^2 - 2x}{2x + 3}$$

$$10. \ y = \frac{3x^2 + 10x - 8}{x^2 + 4}$$

III The graph of a function in the form  $f(x) = \frac{a}{x^2 + b}$  is shown.

Find the values of a and b.

11.



## ANSWERS

<p>1.</p> <p>A graph showing a blue curve with a vertical asymptote at <math>x = -2</math> and a horizontal asymptote at <math>y = 2</math>. The curve approaches the vertical asymptote from both sides and the horizontal asymptote as <math> x  \rightarrow \infty</math>.</p>	<p>2.</p> <p>A graph showing a blue curve with two vertical asymptotes at <math>x = -3</math> and <math>x = 3</math>, and a horizontal asymptote at <math>y = 1</math>. The curve has branches approaching the vertical asymptotes and the horizontal asymptote as <math> x  \rightarrow \infty</math>.</p>	<p>3.</p> <p>A graph showing a blue curve with a vertical asymptote at <math>x = 0</math> (approaching <math>\pm\infty</math>) and a slant asymptote at <math>y = x</math>. There is a hole at the point where the curve would normally pass through the vertical asymptote at <math>(0, 0)</math>.</p>	
<p>4.</p> <p>A graph showing a blue curve with two vertical asymptotes at <math>x = -5</math> and <math>x = 5</math>, and a horizontal asymptote at <math>y = 1</math>. The curve has branches approaching the vertical asymptotes and the horizontal asymptote as <math> x  \rightarrow \infty</math>.</p>	<p>5.</p> <p>A graph showing a blue curve with a vertical asymptote at <math>x = -2</math> (approaching <math>\pm\infty</math>), a hole at the point <math>(-2, -9)</math>, and a slant asymptote at <math>y = x</math>. The curve has branches approaching the vertical asymptote and the slant asymptote as <math> x  \rightarrow \infty</math>.</p>	<p>6.</p> <p>A graph showing a blue curve with a vertical asymptote at <math>x = 0</math> (approaching <math>\pm\infty</math>), a hole at the point <math>(6, 1/12)</math>, and a slant asymptote at <math>y = x</math>. The curve has branches approaching the vertical asymptote and the slant asymptote as <math> x  \rightarrow \infty</math>.</p>	
<p>7.</p> <p>A graph showing a blue curve with a vertical asymptote at <math>x = -6</math> (approaching <math>\pm\infty</math>), a hole at the point <math>(6, 1/12)</math>, and a slant asymptote at <math>y = x</math>. The curve has branches approaching the vertical asymptote and the slant asymptote as <math> x  \rightarrow \infty</math>.</p>			
<p>8.</p> $\{x \mid x \neq \pm 3\}$ $\{y \mid y \leq 0 \text{ or } y > 3\}$	<p>9.</p> $\left\{ x \mid x \neq -\frac{3}{2} \right\}$ $\{y \mid y \leq -4.791 \text{ or } y \geq -0.209\}$	<p>10.</p> $\{x \mid x \in R\}$ $\{y \mid -3.036 \leq y \leq 4.036\}$	<p>11.</p> $a=12, b=2$