

# Graphing Rational Functions - WKST 1

I. For each function find:

a) Domain b) Zeros c) Y-intercepts d) Holes e) Asymptotes f) Symmetry g) Even/Odd

1. $f(x) = \frac{5x}{x+2}$	2. $y = \frac{x^2 - 4}{2x^3 - 8x}$	3. $g(x) = \frac{4}{(x-5)^2}$	4. $y = \frac{x^4 + 2x^2}{x^3 - 1}$
5. $g(x) = \frac{x^2 - 64}{x - 8}$	6. $f(x) = \frac{x^3 - 4x^2 - 4x + 16}{x^3 - 5x^2 + 4x}$	7. $y = \frac{3}{x^2 + 1}$	

II. Match each function with their graph.

		<p>8. <math>f(x) = \frac{x-4}{-4x-16}</math></p>
		<p>9. <math>f(x) = \frac{x^3 + 5x^2 + 3x - 9}{1-x}</math></p>
		<p>10. <math>f(x) = \frac{x^3 - 16x}{-4x^2 + 4x + 24}</math></p>
		<p>11. <math>f(x) = \frac{x^2 - 9x}{3x^2 - 6x - 9}</math></p>

III. Given the graph state the end behavior.

<p>12.</p>	<p>13.</p>	<p>14.</p>
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IV. Find the average rate of change over the indicated interval.

15. $g(x) = \frac{x-5}{x+2}$ , $[-4, -1]$	16. $y = \frac{3}{x^2+1}$ , $\left[0, \frac{1}{2}\right]$
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V. Write an equation of the function with the given characteristics.

17. Zero at $x=5$ , Vertical Asymptote at $x=-3$ , Horizontal Asymptotes at $y=2$
18. Zero at $x=0.5$ , Hole at $x=7$ , Vertical Asymptotes at $x=3$ , $x=0$ , Horizontal Asymptote at $y=0$ .

# ANSWERS

1.

a) $\{x x \neq -2\}$	b) $x=0$	c) $(0,0)$	d) none	e) HA: $y=5$ , VA: $x=-2$ , SA: none	f) none	g) none
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2.

a) $\{x x \neq \pm 2\}$	b) none	c) none	d) $\left(2, \frac{1}{4}\right)$ , $\left(-2, -\frac{1}{4}\right)$	e) HA: $y=0$ , VA: $x=0$ , SA: none	f) origin	g) odd
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3.

a) $\{x x \neq 5\}$	b) none	c) $\left(0, \frac{4}{25}\right)$	d) none	e) HA: $y=0$ , VA: $x=5$ , SA: none	f) none	g) none
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4.

a) $\{x x \neq 1\}$	b) $x=0$	c) $(0,0)$	d) none	e) HA: none, VA: $x=1$ , SA: $y=x$	f) none	g) none
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5.

a) $\{x x \neq 8\}$	b) $x=-8$	c) $(0,8)$	d) $(8,16)$	e) HA: none, VA: none, SA: none	f) none	g) none
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6.

a) $\{x x \neq 0,1,4\}$	b) $x=\pm 2$	c) none	d) $(4,1)$	e) HA: $y=1$ , VA: $x=0$ & $x=1$ , SA: none	f) none	g) none
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7.

a) $\{x x \in \mathbb{R}\}$	b) none	c) $(0,3)$	d) none	e) HA: $y=0$ , VA: none, SA: none	f) y-axis	g) even
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8. A

9. D

10. C

11. B

12.  $x \rightarrow -\infty$      $y \rightarrow 1/4$

$x \rightarrow \infty$      $y \rightarrow 1/4$

13.  $x \rightarrow -\infty$      $y \rightarrow 0$

$x \rightarrow \infty$      $y \rightarrow 0$

14.  $x \rightarrow -\infty$      $y \rightarrow \infty$

$x \rightarrow \infty$      $y \rightarrow -\infty$

15.  $-\frac{7}{2}$

16.  $-\frac{6}{5}$

17.  $f(x) = \frac{2x-10}{x+3}$

18.  $f(x) = \frac{2x^3-15x+7}{x^3-10}$