

# 1.10 Rational Functions & Holes

AP Precalculus

Name: \_\_\_\_\_

**CA #1**

**Find the hole(s) of the following rational functions, if one exists.**

1.

$$f(x) = \frac{x^2 - 36}{x^2 - 8x + 12}$$

2.

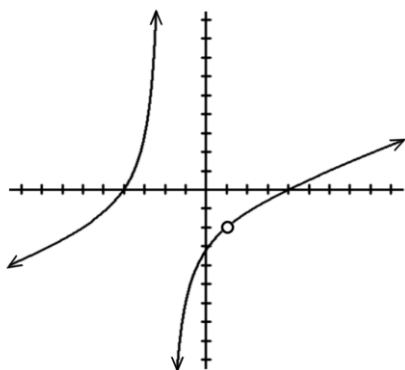
$$g(x) = \frac{5x^2 + 20x}{x^2 + 9x + 20}$$

3.

$$h(t) = \frac{t^2 + 12t + 36}{t^2 + t - 30}$$

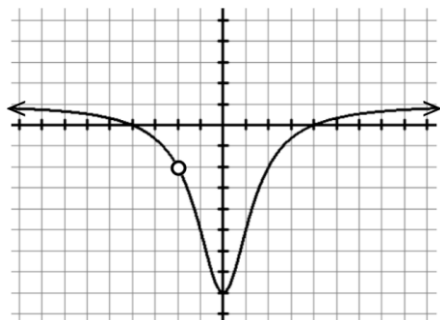
**Use the graph of  $f$  to find the hole(s). Use limit notation.**

4.



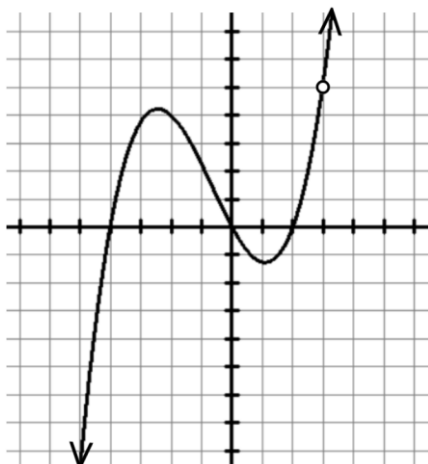
Limit Notation Hole(s):

5.



Limit Notation Hole(s):

6.



Limit Notation Hole(s):

**CALCULATOR ACTIVE Complete the table to answer the following.**

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

$x$	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$							

Hole:

Limit Notation of Hole:

**CALCULATOR ACTIVE Complete the table to answer the following.**

8.  $f(x) = \frac{x^3+8}{x+2}$

$x$	-2.1	-2.01	-2.001	-2	-1.999	-1.99	-1.9
$f(x)$							

Hole:

Limit Notation of Hole:

**Answers to 1.10 CA #1**

1. $x = 6$	2. $x = -4$	3. $t = -6$																																
4. $\lim_{x \rightarrow 1^-} f(x) = -2$ and $\lim_{x \rightarrow 1^+} f(x) = -2$	5. $\lim_{x \rightarrow -2^-} f(x) = -2$ and $\lim_{x \rightarrow -2^+} f(x) =$	6. $\lim_{x \rightarrow 3^-} f(x) = 5$ and $\lim_{x \rightarrow 3^+} f(x) = 5$																																
7. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th><math>x</math></th><th><math>f(x)</math></th></tr> <tr><td>1.9</td><td>3.6316</td></tr> <tr><td>1.99</td><td>3.5126</td></tr> <tr><td>1.999</td><td>3.5013</td></tr> <tr><td>2</td><td>undefined</td></tr> <tr><td>2.001</td><td>3.4999</td></tr> <tr><td>2.01</td><td>3.4876</td></tr> <tr><td>2.1</td><td>3.381</td></tr> </table> <p style="text-align: center;">hole: <math>x = 2</math>  <math>\lim_{x \rightarrow 2^-} f(x) = 3.5</math>      <math>\lim_{x \rightarrow 2^+} f(x) = 3.5</math></p>		$x$	$f(x)$	1.9	3.6316	1.99	3.5126	1.999	3.5013	2	undefined	2.001	3.4999	2.01	3.4876	2.1	3.381	8. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><th><math>x</math></th><th><math>f(x)</math></th></tr> <tr><td>-2.1</td><td>12.61</td></tr> <tr><td>-2.01</td><td>12.06</td></tr> <tr><td>-2.001</td><td>12.006</td></tr> <tr><td>-2</td><td>undefined</td></tr> <tr><td>-1.999</td><td>11.994</td></tr> <tr><td>-1.99</td><td>11.94</td></tr> <tr><td>-1.9</td><td>11.41</td></tr> </table> <p style="text-align: center;">hole: <math>x = -2</math>  <math>\lim_{x \rightarrow -2^-} f(x) = 12</math>      <math>\lim_{x \rightarrow -2^+} f(x) = 12</math></p>	$x$	$f(x)$	-2.1	12.61	-2.01	12.06	-2.001	12.006	-2	undefined	-1.999	11.994	-1.99	11.94	-1.9	11.41
$x$	$f(x)$																																	
1.9	3.6316																																	
1.99	3.5126																																	
1.999	3.5013																																	
2	undefined																																	
2.001	3.4999																																	
2.01	3.4876																																	
2.1	3.381																																	
$x$	$f(x)$																																	
-2.1	12.61																																	
-2.01	12.06																																	
-2.001	12.006																																	
-2	undefined																																	
-1.999	11.994																																	
-1.99	11.94																																	
-1.9	11.41																																	