

Unit 4 Quiz 1 Review

Determine the following for the given function.

Name: Key  $y = \frac{1}{-2(x-7)}$

$$f(x) = \frac{x+4}{-2x^2+6x+56} = \frac{x+4}{-2(x^2-3x-28)} = \frac{x+4}{-2(x-7)(x+4)}$$

State the:

*x-value of hole + V.A.*  
*→ skip hole*

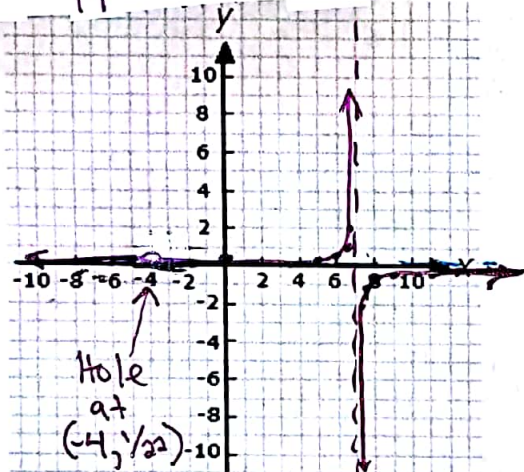
- 1) Domain:  $(-\infty, -4) \cup (-4, 7) \cup (7, \infty)$  6) vertical asymptotes:  $x=7$  (V.A.)  
 2) Range:  $(-\infty, 0) \cup (0, \frac{1}{22}) \cup (\frac{1}{22}, \infty)$  horizontal asymptotes:  $y=0$  (H.A.)  
*small degree / large degree → y=0*

use left-over equation  $y = \frac{1}{-2(x-7)}$

- 3) Coordinate of the removable discontinuity:  $(-4, \frac{1}{22})$  Hole  
 $x+4=0$   
 4) x-intercepts: none  
 $0 = \frac{1}{-2(x-7)} \rightarrow 0=1$  non-sense so no x-ints  
 5) y-intercepts:  $(0, \frac{1}{14})$   
 $y = \frac{1}{-2(0-7)} = \frac{1}{14}$

Since you have a horizontal asymptote here, that's your limit

10) Sketch: plot at least 3 exact points left of hole, from hole to V.A., and right of V.A. \*  
 H.A.:  $y=0$



x	f(x) = 1/(-2(x-7))
6.75	2
6.5	1
5	1/4
6	1/2
7	—
8	-1/2
9	-1/4
7.5	-1
7.25	-2

← V.A. at x=7

11) Give the domain and range of the following functions.

a.  $f(x) = \frac{5x^2-30x}{10x} = \frac{5x(x-6)}{5x(2)}$   
 Hole at  $(0, 3)$   
 $5x=0$   
 D:  $(-\infty, 0) \cup (0, \infty)$   
 R:  $(-\infty, 3) \cup (3, \infty)$   
 VA: none  
 HA: none

b.  $g(x) = \frac{x-3}{\sqrt{x-1}}$   
 Hole: none  
 D:  $(1, \infty)$   
 R:  $(-\infty, \infty)$   
 VA:  $x=1$   
 HA: none

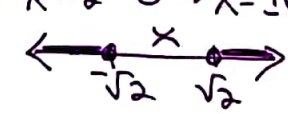
c.  $f(x) = -x^2+3$   
 In calc get 11 from MATH → Num 1: abs  
 D:  $(-\infty, \infty)$   
 R:  $[0, \infty)$

d.  $g(x) = \sqrt{x^4-x^2-2} = \sqrt{(x^2+1)(x^2-2)}$   
 $x^2+1=0 \rightarrow$  imag  
 $x^2-2=0 \rightarrow x = \pm\sqrt{2}$   
 D:  $(-\infty, -\sqrt{2}] \cup [\sqrt{2}, \infty)$   
 R:  $[0, \infty)$

12) For parts a and b above describe the end behavior using limit notation

a.  $\lim_{x \rightarrow \infty} f(x) = \infty$   
 $\lim_{x \rightarrow -\infty} f(x) = -\infty$

c.  $\lim_{x \rightarrow \infty} f(x) = \infty$   
 $\lim_{x \rightarrow -\infty} f(x) = \infty$



Fix 12b

Fix