

Analyzing Rational Functions II (9.2) p452 day 3

ex1: Sketch $y = \frac{x^2 - 5x + 6}{3 - x}$

$y = \frac{(x-3)(x-2)}{3-x} = \frac{(x-2)}{-1} = -x+2$

hole at $x=3$

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ex2: Sketch $y = \frac{2x}{x^2 - 4}$

$y = \frac{2x}{(x+2)(x-2)}$

V.A. $x = -2, 2$

H.A. $y = \frac{2x}{x^2} = \frac{2}{x} = 0$

Y-int $y = \frac{0}{-4} = 0$

X-int $2x = 0 \Rightarrow x = 0$

test $x = -3$: $y = \frac{-6}{-5} = \frac{6}{5}$

test $x = -1$: $y = \frac{-2}{-3} = \frac{2}{3}$

test $x = 1$: $y = \frac{2}{-3} = -\frac{2}{3}$

test $x = 3$: $y = \frac{6}{5}$

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ex3: Sketch $y = \frac{2x+4}{x^2+1}$

$y = \frac{2(x+2)}{x^2+1}$

V.A. $x^2+1=0 \Rightarrow x^2=-1$ no V.A.

H.A. $y = \frac{2x}{x^2} = \frac{2}{x} = 0$

Y-int $y = \frac{4}{1} = 4$

X-int $2x+4=0 \Rightarrow x = -2$

test $x = -3$: $y = \frac{-6+4}{10} = -\frac{2}{10} = -\frac{1}{5}$

test $x = 1$: $y = \frac{2+4}{2} = \frac{6}{2} = 3$

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hw: p452 #4c, 6, 7b, 8c

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4c $y = \frac{x^2 + 2x - 8}{x^2 - 2x - 8}$

$y = \frac{(x+4)(x-2)}{(x-4)(x+2)}$

V.A. $x = -4, 2$

H.A. $y = \frac{x^2}{x^2} = 1$

Y-int $y = \frac{-8}{-8} = 1$

X-int $(x+4)(x-2) = 0 \Rightarrow x = -4, x = 2$

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6 A $f(x) = \frac{x^2 + x - 2}{x^2 + x - 20} = \frac{(x+2)(x-1)}{(x+5)(x-4)}$

B $g(x) = \frac{x^2 - 5x + 4}{x^2 - x - 2} = \frac{(x-4)(x-1)}{(x-2)(x+1)}$

C $h(x) = \frac{x^2 - 5x + 6}{x^2 - 5x + 4} = \frac{(x-3)(x-2)}{(x-4)(x+1)}$

D $j(x) = \frac{x^2 + x - 12}{x^2 - 3x - 10} = \frac{(x+4)(x-3)}{(x-5)(x+2)}$

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7b b)

hole $x = -3$ $(x+3)$
 v.a. $x = 1$ $(x-1)$
 h.a. $y = 1$
 x int 7

$$y = \frac{(x+3)(x-7)}{(x+3)(x-1)}$$

$$y = \frac{x^2 - 4x - 21}{x^2 + 2x - 3}$$

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c) a point of discontinuity at $(-2, \frac{1}{5})$.

8c a vertical asymptote at $x = 3$, and an x-intercept of -1

hole $x = -2$ $y = \frac{(x+2)(x+1)}{(x+2)(x-3)}$