

Math 113

Group Quiz 15 Solutions

①
(10 each)

Graph	[2] x-intercept(s)	[2] y-intercepts	[3] horizontal asymptote	[3] vertical asymptote
(a)	(0,0)	(0,0)	$y=0$ $y \rightarrow 0$ as $x \rightarrow \infty$ $y \rightarrow 0$ as $x \rightarrow -\infty$	$x = -3$ $x = 4$
(b)	(4,0)	(0,4)	$y=2$ $y \rightarrow 2$ as $x \rightarrow \infty$ $y \rightarrow 2$ as $x \rightarrow -\infty$	$x=2$ $y \rightarrow \infty$ as $x \rightarrow 2^-$ $y \rightarrow -\infty$ as $x \rightarrow 2^+$
(c)	(-1,0) (1,0)	(0,0.05)	$y=1$ $y \rightarrow 1$ as $x \rightarrow \infty$ $y \rightarrow 1$ as $x \rightarrow -\infty$	$x = -4$ $x = 4$
(d)	(-3,0) (3,0)	(0,-7)	$y=2$ $y \rightarrow 2$ as $x \rightarrow \infty$ $y \rightarrow 2$ as $x \rightarrow -\infty$	none

② a) $r(x) = \frac{2x-3}{x^2-1}$ degree = 1 → H.A: $y=0$ [10]
 degree = 2

Set Denominator Equal to Zero to find V.A
 $x^2-1=0$
 $(x-1)(x+1)=0$ → V.A: $x=-1$ [5]
 $x=1, -1$ $x=1$ [5]

② b) $r(x) = \frac{x^3 + 3x^2}{3x^2 - 13x + 4}$ Degree = 3 → no H.A. [10]
 Degree = 2

Set Denominator equal to zero to find V.A.
 $3x^2 - 13x + 4 = 0$
 $(3x - 1)(x - 4) = 0$ → V.A: $x = \frac{1}{3}$ [5]
 $x = 4$ [5]

c) $r(x) = \frac{5x^2 + 4x - 1}{3x^2 + 5x - 2}$ Degree = 2 → H.A: $y = \frac{5}{3}$ [10]
 Degree = 2

Set Denominator equal to zero to find V.A.
 $3x^2 + 5x - 2 = 0$
 $(3x - 1)(x + 2) = 0$ → V.A: $x = \frac{1}{3}$ [5]
 $x = -2$ [5]