

Extra Practice Unit 4 ICM

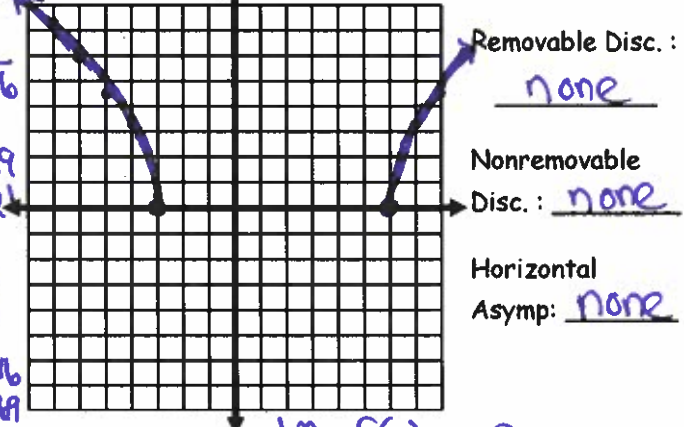
Functions and Limits

Name: Key

1. When finding the domain, some key items to consider are x-intercept, x-value of hole(s), and vertical asymptotes
 2. When finding the range, some key items to consider are x-intercept, y-value of hole(s), and horizontal asymptotes
 (esp. if HA $y=0$)

Graph each function, showing the key features and plotting at least 3 points per curve. Also find the requested values. (Hint, see #1 and 2 for help with domain and range.)

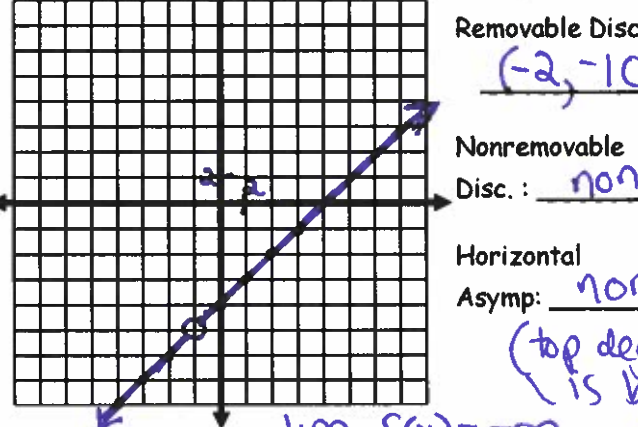
3. $f(x) = \sqrt{x^2 - 3x - 18}$ x-int: (-3,0) (6,0)
 $(x-6)(x+3)=0$ y-int: none



Removable Disc.: none
 Nonremovable Disc.: none
 Horizontal Asymp: none

End Behavior, written as Limits:
 $\lim_{x \rightarrow -\infty} f(x) = \infty$
 $\lim_{x \rightarrow \infty} f(x) = \infty$
 Domain: $(-\infty, -3] \cup [6, \infty)$
 Range: $[0, \infty)$

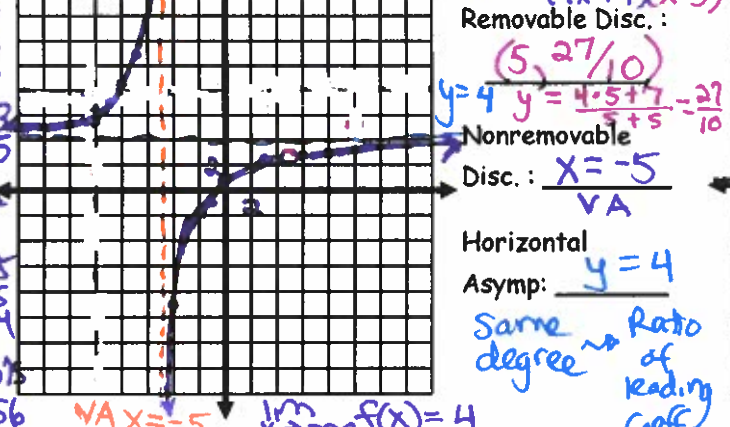
4. $f(x) = \frac{x^2 - 6x - 16}{x+2}$ x-int: (8,0)
 $(x-8)(x+2)$ y-int: (0,-8)



Removable Disc.: (-2, -10)
 Nonremovable Disc.: none
 Horizontal Asymp: none
 (top degree is bigger)

End Behavior, written as Limits:
 $\lim_{x \rightarrow -\infty} f(x) = -\infty$
 $\lim_{x \rightarrow \infty} f(x) = \infty$
 Domain: $(-\infty, -2) \cup (-2, \infty)$
 Range: $(-\infty, -10) \cup (-10, \infty)$

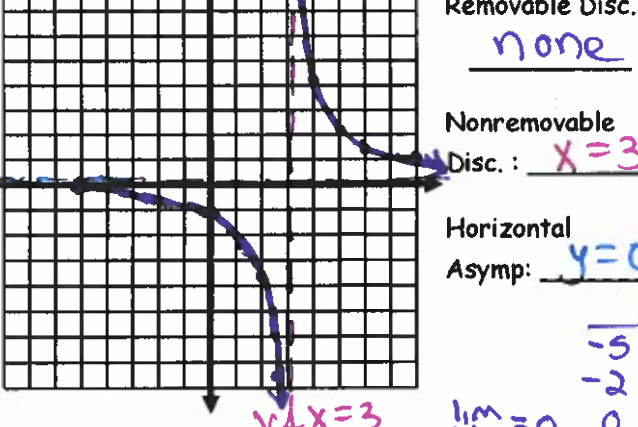
5. $f(x) = \frac{4x^2 - 13x - 35}{x^2 - 25}$ x-int: (-5,0) (7,0)
 $(4x+7)(x-5)$ y-int: (0, -27/10)
 $(x+5)(x-5)$ VA: $x = -5$



Removable Disc.: (5, 27/10)
 Nonremovable Disc.: $x = -5$ VA
 Horizontal Asymp: $y = 4$
 Same degree \rightarrow Ratio of leading coeff.

End Behavior, written as Limits:
 $\lim_{x \rightarrow -\infty} f(x) = 4$
 $\lim_{x \rightarrow \infty} f(x) = 4$
 Domain: $(-\infty, -5) \cup (-5, 5) \cup (5, \infty)$
 Range: $(-\infty, 27/10) \cup (27/10, 4) \cup (4, \infty)$

6. $f(x) = \frac{\sqrt{2x+10}}{x-3}$ x-int: (-5,0)
 y-int: (0, -sqrt(10)/3)



Removable Disc.: none
 Nonremovable Disc.: $x = 3$ VA
 Horizontal Asymp: $y = 0$

End Behavior, written as Limits:
 $\lim_{x \rightarrow -\infty} f(x) = 0$
 $\lim_{x \rightarrow \infty} f(x) = 0$
 Domain: $(-5, 3) \cup (3, \infty)$
 Range: $(-\infty, \infty)$

we don't skip HA $y=0$ here because x-int (-5,0)

-5	0
-2	-4.9
0	-1.05
2	-3.74
3	-
4	4.24
5	2.24
6	1.56
8	1.01