

NAME: \_\_\_\_\_ Score \_\_\_\_\_ /10

Please **print** your name**No Decimals No mixed numbers No complex fractions No boxed or circled answers****Do all sketching on the coordinate system provided.**

1. Consider the function  $f$  whose rule is  $f(x) = \frac{4x^2 + 5x - 6}{2x^2 - 9x - 5} = \frac{(4x - 3)(x + 2)}{(2x + 1)(x - 5)}$

- a. What is the domain of  $f$ ?  $\left(-\infty, -\frac{1}{2}\right) \cup \left(-\frac{1}{2}, 5\right) \cup (5, +\infty)$  sketch it.
- b. What are the zeros of  $f$ ?  $\frac{3}{4}$  and  $-2$  sketch it.
- c. What are the vertical asymptotes of  $f$ ? The lines  $x = -\frac{1}{2}$  and  $x = 5$  sketch it.
- d. What is the horizontal asymptote of  $f$ ? **The line  $y = 2$**  sketch it.
- e. Sketch the graph of  $f$ . The following calculations will help. I did some for you.
- $f(-3) = \frac{(4[-3] - 3)(-3 + 2)}{(2[-3] + 1)(-3 - 5)} = \frac{(-15)(-1)}{(-5)(-8)} = \frac{15}{40} = \frac{3}{8}$ . Plot the corresponding point.
  - Calculate  $f(-1)$ . Plot the corresponding point.  

$$f(-1) = \frac{4 - 5 - 6}{2 + 9 - 5} = \frac{-7}{6}$$
  - Calculate  $f(0)$ . Plot the corresponding point.  

$$f(0) = \frac{-6}{-5} = \frac{6}{5}$$
  - $f(1) = -\frac{1}{4}$ . Plot the corresponding point.
  - $f(7) = \frac{45}{6}$ . Plot the corresponding point.
- vi. The graph of  $f$  crosses its horizontal asymptote at  $\left(-\frac{1}{5}, 2\right)$ .

