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MAC 1105.1A26
Cyr

Quiz 11

You must show all work to receive full credit!!

Problem 1. (3 pts) Let $f(x) = \frac{x^2 - 2x - 3}{2x^2 - 3x - 5}$.

(a) Find the equations of the vertical and horizontal asymptotes for the graph of f .

$$f(x) = \frac{x^2 - 2x - 3}{2x^2 - 3x - 5} = \frac{(x-3)(x+1)}{(2x-5)(x+1)} = \frac{x-3}{2x-5}$$

$$\text{VA: set den} = 0, \text{ so } 2x - 5 = 0 \Rightarrow 2x = 5 \Rightarrow \boxed{x = \frac{5}{2}}$$

HA: since $\deg \text{ num} = \deg \text{ den} = 2$, take ratio of leading coefficients,

$$\boxed{y = \frac{1}{2}}$$

(b) Does the graph of f have any holes? If so, find the coordinates of the holes.

Since $x+1$ is canceled factor, graph has a hole at $x = -1$

$$y = \frac{x-3}{2x-5} \Rightarrow y(-1) = \frac{-1-3}{2(-1)-5} = \frac{-4}{-7} = \frac{4}{7}$$

$$\boxed{\text{hole at } (-1, \frac{4}{7})}$$

Problem 2. (2 pts) Solve the following system of equations (write your final answer as an ordered pair):

$$\begin{cases} 4x - 5y = -11 & (1) \\ 2x + y = 5 & (2) \end{cases}$$

Substitution Method

$$y = -2x + 5 \text{ from (2)} \Rightarrow$$

$$4x - 5(-2x + 5) = -11$$

$$4x + 10x - 25 = -11$$

$$14x = 14$$

$$\underline{x = 1}$$

$$y = -2x + 5 = -2(1) + 5$$

$$\underline{y = 3}$$

$$\boxed{(1, 3)}$$

Elimination method

Multiply (2) by -2 :

$$\begin{array}{r} 4x - 5y = -11 \\ + -4x - 2y = -10 \\ \hline -7y = -21 \\ \underline{y = 3} \end{array}$$

Sub into (2): $2x + 3 = 5$

$$2x = 2$$

$$\underline{x = 1}$$

$$\boxed{(1, 3)}$$