

Math 111: Final Review 6

1. Graph the function given by: $f(x) = \frac{3x^2 - 12x - 36}{x^2 + x - 20}$

Graph each asymptote with a dashed line, and give the equation for each asymptote.
Show all calculations used to find zeros and asymptotes

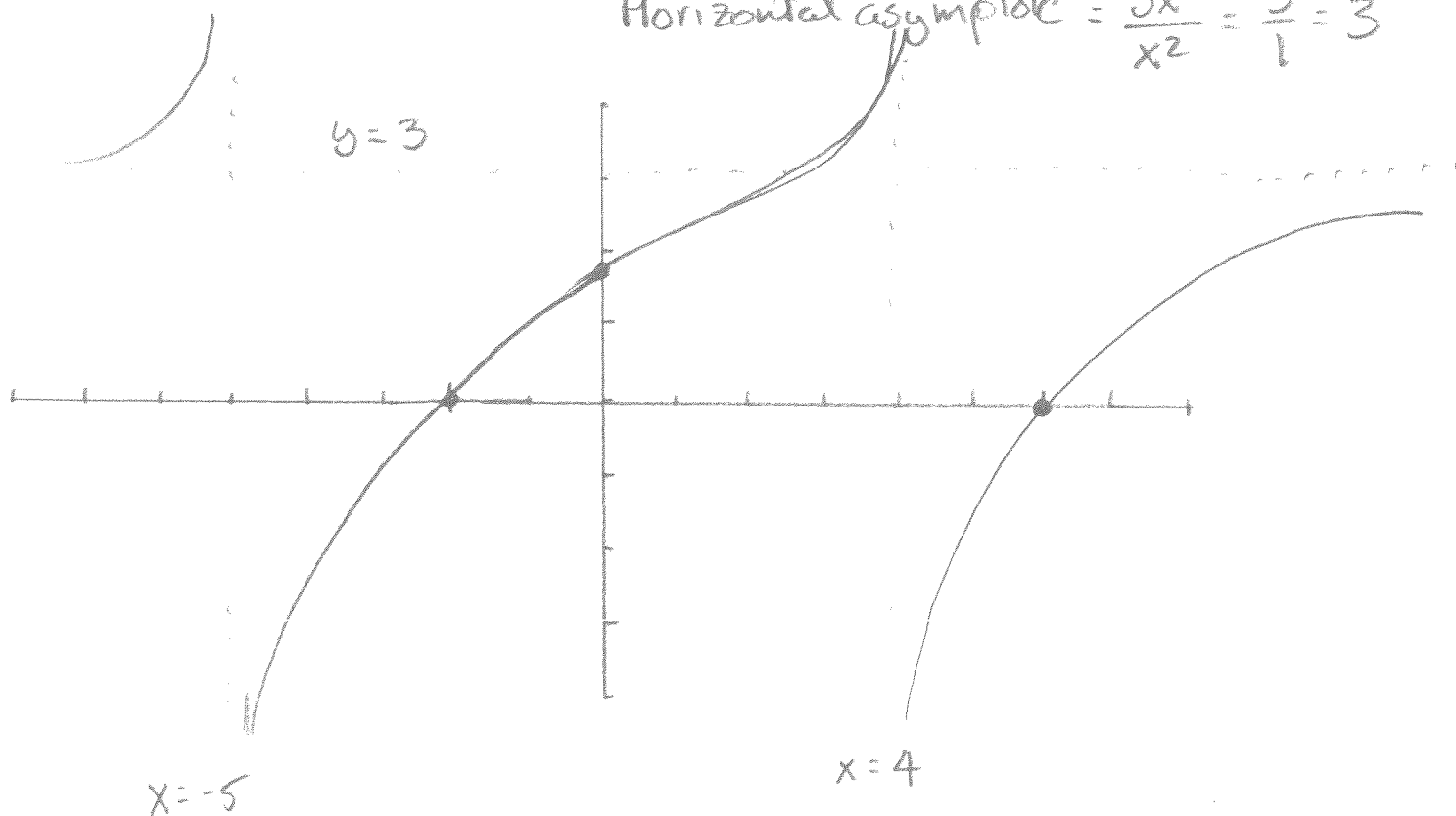
$$f(x) = \frac{3x^2 - 12x - 36}{x^2 + x - 20} = \frac{3(x^2 - 4x - 12)}{(x+5)(x-4)} = \frac{3(x-6)(x+2)}{(x+5)(x-4)}$$

Vertical asymptotes: $x = -5$, $x = 4$

Zeros: $x = 6$, $x = -2$

y-int: $f(0) = \frac{-36}{-20} = \frac{9}{5}$

Horizontal asymptote: $\frac{3x^2}{x^2} = \frac{3}{1} = 3$



2. Graph the function given by: $f(x) = \frac{x^2 + 12x + 32}{3x^3 + 6x^2 - 45x}$

Graph each asymptote with a dashed line, and give the equation for each asymptote.
Show all calculations used to find zeros and asymptotes

$$f(x) = \frac{x^2 + 12x + 32}{3x^3 + 6x^2 - 45x} = \frac{(x+4)(x+8)}{3x(x^2 + 2x - 15)} = \frac{(x+4)(x+8)}{3x(x+5)(x-3)}$$

Vertical Asymptotes: $x = 0, x = -5, x = 3$

Zeros: $x = -4, x = -8$

y-int = $f(0) = \frac{32}{0} = \text{v. asymptote}$

Horizontal Asymptote = $y = \frac{x^2}{3x^3} = 0$

