

# Math 1513 - College Algebra

## Written Assignment 10 - Due 2015.10.25

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Directions: Please answer the following question in complete sentences. Be sure to label all geometric objects in any illustrations. I will accept an answer in a scanned image format, as a pdf, or sent from your awesome picture phone.

Question: Consider the function  $f(x) = \frac{ax^2 + k}{bx^2 + h}$  where  $a, b, k,$  and  $h$  are all constants with  $a, b > 0$ .

- (a) What can you say about asymptotes and intercepts of this function if  $h, k > 0$ ?
- (b) Now assume that  $k < 0$  and  $h > 0$ . How does this affect the asymptotes? The intercepts?
- (c) If  $b = 1$  and  $a > 1$ , how does this affect the results from part (b)?
- (d) How is the graph affected if  $k > 0$  and  $h < 0$ ?
- (e) Find values of  $a, b, h,$  and  $k$  that create a function with a horizontal asymptote at  $y = \frac{3}{2}$ ,  $x$ -intercepts at  $(-5, 0)$  and  $(5, 0)$ , a  $y$ -intercept of  $(0, -2)$  and no vertical asymptotes.