

Name _____

Student Number _____

Show all work. Label your answers clearly.

1. Let $g(x) = 13x^3 + 2x - 7$ and $h(x) = -23x^2 + 2x - 1$.

What is $(g - h)(x)$? (Simplify your answer.)

2. Let $f(x) = \frac{x^2 - 4}{x^2 + 4x + 4}$.

a) Find the zeroes, horizontal asymptotes and vertical asymptotes of $f(x)$.

b) Sketch a graph of $f(x)$, labeling significant features of the graph.

3. Shane has a small newspaper route. Without any help from his friends, it takes him 42 minutes to deliver his papers. Some days Shane gets his friends to help him. When 2 friends help, his paper route takes 18 minutes. However, no matter how many friends help, it always takes at least 6 minutes.

a) Find a linear-to-linear rational function giving the time T it takes Shane and his friends to complete the route, in terms of the number of friends x helping Shane.

b) How many friends does Shane need to recruit so that he can be done with his paper route in 12 minutes?