9. [9 points] You do not need to show work in this problem, but limited partial credit may be awarded for work shown.

    a. [5 points] Consider the rational function

$$g(x) = \frac{(Bx^A + 7)(4x - C)}{(3x^2 + 5)(2x - 12)(x - D)},$$

where $A, B, C,$ and D are constants. Suppose that
- $y = 8$ is a horizontal asymptote of $g(x)$
- $x = 5$ is the only vertical asymptote of $g(x)$.

Find the values of $A, B, C,$ and D.

Answer: $A =$ _____ $B =$ _____ $C =$ _____ $D =$ _____

    b. [4 points] Consider the piecewise function

$$h(x) = \begin{cases} E + \dfrac{28}{3^x + 4} & x \leq 1 \\[3mm] G + \dfrac{F}{7^x + 5} & x > 1 \end{cases}$$

where $E, F,$ and G are constants. Suppose that
- $\lim\limits_{x \to \infty} h(x) = 8.5$
- $\lim\limits_{x \to -\infty} h(x) = 12$
- $h(x)$ is continuous at $x = 1$.

Find the values of $E, F,$ and G.

Answer: $E =$ _____ $F =$ _____ $G =$ _____