1. For his New Year's Resolution, Nick is going to change from drinking Mountain Dew to drinking tea. He climbs to the top of the Centennial Bridge and launches his Mountain Dew bottle into the Mississippi with a slingshot. Use the quadratic function that models projectile motion to answer the following questions, where x represents the time in seconds and $f(x)$ represents the height of the pop in feet.

$$f(x) = -16x^2 + 92x + 170$$

a) What is the height of the Centennial Bridge?

b) What will the height of the pop be after 6.5 seconds?

c) What is the maximum height of the pop container?

d) At what time(s) will the container be at a height of 250 feet?

e) How long does it take for the coffee container to hit the water?

2. Divide using long division or synthetic division $\dfrac{4x^3 + 6x^2 - 5}{2x - 3}$

3. Mari and Liam can each wash a car and vacuum its interior in 2 hours. Zach needs 3 hours to do this same job alone. If Zach, Liam, and Mari work together, how long will it take them to clean a car?

4. Use the given equation and factors to answer the questions.

$$f(x) = x^4 + x^3 + 13x^2 + 25x - 300; (x - 3) \text{ and } (x + 4)$$

a) How many total zeros?

b) Find all of the zeros.

5. For the function $g(x) = \dfrac{4x - 12}{x - 1}$, find

a) vertical asymptote(s)
b) holes
c) x-intercept(s)
d) y-intercept
e) horizontal asymptote
f) graph the function using a table