For each problem, show your work.

1. **(11 points)** Answer the following questions about the rational function $f(x) = \frac{(2x+1)(x+2)}{(x+2)^2(x-3)}$.

   (a) **(3 point)** What is the domain of this function?

   (b) **(1 point)** Calculate the y-intercept of this function, if it exists, or explicitly assert that it does not exist.

   (c) **(3 point)** What if any x-intercepts does this function have? If it has none, explicitly say so.

   (d) **(4 points)** Find the horizontal, vertical, and slant asymptotes of this function. For each asymptote you identify, indicate which type it is, and give its equation. If the function has no asymptotes, explicitly say so.

2. **(4 points)** For which values of x is $x^2 + 3x > 2x^2 + 2$? Give your result in interval form.

3. **(5 points)** For which values of t is $\frac{t}{t+2} \leq \frac{t+4}{t}$? Give your result in interval form.