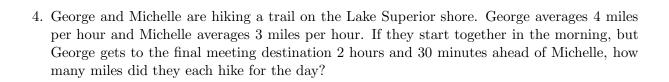
Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the quotient and the remainder of the division  $(x^3 + 3x + 2) \div (x + 3)$ .

2. Solve the rational equation  $5 + \frac{x+1}{x-1} = 3 - \frac{5x-3}{x-1}$ .

3. Simplify the complex fraction  $\frac{x^{-2}-y^{-2}}{x^{-2}y^{-1}+x^{-1}y^{-2}}.$ 



5. Simplify the following expressions (write the answer without negative or rational exponents):

(a) 
$$(2a^{1/2}b^{-1/3})^6$$

(b) 
$$(2\sqrt{5} + \sqrt{2})(3\sqrt{5} - \sqrt{2})$$