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. Perform the operations and write your answer in lowest terms:

(a)
$$\frac{2x^2 - 5x - 12}{4x + 6} \div \frac{x^2 - 16}{2} =$$

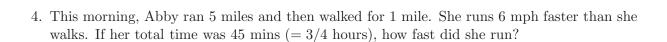
(b)
$$\frac{x+1}{x^2+3x} - \frac{1}{x-3} + \frac{1}{x^2-9} =$$

2. (a) Simplify the complex fraction
$$\frac{\frac{x-1}{x+2} - \frac{x-2}{x+3}}{\frac{x-3}{x+3} + \frac{x+1}{x+2}} =$$

(b) Perform the division and the write your answer in the appropriate form: $(3x^3 - 5x^2 +$ $19x) \div (3x+1).$

3. Solve the equation

$$\frac{5}{x} - \frac{4}{x+2} = \frac{1}{5} + \frac{1}{5x}.$$



5. Perform the operations and simplify (leave no negative exponents):

(a)
$$\sqrt[3]{54a^7b^5} =$$

(b)
$$(-8)^{-4/3} =$$

(c)
$$\left(\frac{a^{-1/2}}{b^{-1/4}}\right)^{-4} =$$

(d)
$$2\sqrt{45} - 3\sqrt{20} =$$