

YOUR NAME: _____

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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. Solve the absolute value equation $|x^2 + 2x - 19| = 16$.

2. Perform the subtraction and simplify:

$$\frac{8x - 8}{4x^2 - 4} - \frac{9x}{3x^2 - 3x - 6} =$$

3. Use long division to find the quotient and the remainder of $(3x^3 + x^2 - 7x + 6) \div (3x - 5)$ and write your answer in appropriate form.

4. Solve the rational equation $\frac{x+4}{x^3+8} + \frac{x+2}{x^2-2x+4} = \frac{11}{2x+4}$.

Hint: Recall the identity $a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$.

5. Aurora runs 5 miles and then walks 1 mile. She runs 6 mph faster than she walks. Her total time exercising yesterday was $45 \text{ min} = \frac{3}{4} \text{ hrs}$.

(a) Let x be Aurora's running speed. Write an equation for her total time in terms of x .

(b) Solve the equation to find her running speed.