

Instructions: Show work on a separate sheet of paper and attach to this page. You may check your work with technology not available in class, but you should be able to solve problems and show work without such technology.

1. Solve the following equations. State all the solutions and eliminate any extraneous ones.

a. $2x - 4(5x + 1) = 3x + 17$

b. $\frac{4}{x+2} + \frac{2}{x-4} = \frac{30}{x^2-2x-8}$

c. $3x^2 - 7x + 1 = 0$

d. $(x - 3)^2 - 24 = 0$

e. $\sqrt{8 - 2x} - x = 0$

f. $4\left|1 - \frac{3}{4}x\right| + 7 = 10$

2. Solve the following inequalities. Write in **simplified** interval notation.

a. $\frac{x}{3} - \frac{3}{4} - 1 > \frac{x}{2}$

b. $\left|\frac{2x+6}{3}\right| > 2$

c. $-3 \leq \frac{2x+5}{3} < 6$

3. Simplify.

a. $\frac{1 - \frac{x}{x+2}}{1 + \frac{1}{x}}$

b. $\frac{2x\sqrt{x^2+5} - \frac{2x^3}{\sqrt{x^2+5}}}{x^2+5}$

4. Factor and simplify $x(x + 3)^{-3/5} + (x + 3)^{2/5}$.