

Worksheet 3

Sections 1.4 and 1.5

Section 1.4

Problem 1. Simplify the compound fractional expression

$$\frac{x^{-2} - y^{-2}}{x^{-1} + y^{-1}}.$$

Hint: You can rewrite this expression using the law of exponents $a^{-n} = \frac{1}{a^n}$.

Problem 2. Simplify the fractional expression

$$\frac{\frac{1}{\sqrt{x+h}} - \frac{1}{\sqrt{x}}}{h}.$$

Hint: The least common denominator of $\frac{1}{\sqrt{x+h}}$ and $\frac{1}{\sqrt{x}}$ is the product of the denominators.

Problem 3. Simplify the expression

$$\frac{3(1+x)^{1/3} - x(1+x)^{-2/3}}{(1+x)^{2/3}}.$$

Problem 4. Rationalize the denominator of

$$\frac{2}{\sqrt{2} + \sqrt{7}}.$$

Section 1.5

Problem 5. Find all real solutions of the equation below by

- (a) completing the square,
- (b) using the quadratic formula.

$$2x^2 + 8x + 1 = 0$$

Problem 6. Find all real solutions of the equation

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

Problem 7. Find all real solutions of the equation

$$\sqrt{1+x} + \sqrt{1-x} = 2.$$

Problem 8. Use the discriminant to determine the number of real solutions of the equation. Do not solve the equation.

$$x^2 - 6x + 1 = 0.$$