

Math 31A – Worksheet 1

Due on Gradescope: Sunday, October 4, at 11:59 p.m.

Algebra Review

1. Solve each of the following equations in $\mathbb{R}$.

(a) $x^2 + x - 6 = 0$

(b) $2x^2 + x = 10$

(c) $x^2 + 4x + 5 = 0$

2. Factor each of the following expressions.

(a) $x^2 - 4$

(b) $x^2 - 5x + 6$

(c) $2x^2 + x - 10$

Algebra Review (continued)

3. Find the domain of the fraction

$$\frac{x^2 + 4}{\sqrt{x + 2} - 3},$$

and rationalize its denominator. That is, simplify the fraction so that there is no square root in the denominator.

4. Consider the fraction

$$f(x) = \frac{x^2 + x - 2}{x^2 - 4x + 3}.$$

(a) Factor both the numerator and denominator of $f(x)$.

(b) By using your answer to part (a), simplify the expression for $f(x)$; call the new, simplified expression $g(x)$.

(c) Are f and g the exact same function? Why or why not?