Algebra Review

There are three sections to this review, each with 10 questions. The material here is considered prerequisite. You should be able to complete most of the problems fairly easily, with a few of them being more challenging. If you find yourself very lost early in each section, seek help from your instructor or tutor or at the LRC immediately.

Solving Equations: solve each of the following

(1) $3(x-1) = 4(2-x)$

(2) $x^2 - 3x = 0$

(3) $x^2 - 3x = 4$

(4) $x^2 + 2x - 10 = 0$

(5) $\sqrt{4x^2 + 9x} = 0$

(6) $\dfrac{2}{3+x} = \dfrac{8}{5-x}$

(7) $\dfrac{1}{x^2+x} = \dfrac{2}{5x}$

(8) $\dfrac{x^2+5x+4}{x^2-9x+10} = 0$

(9) $\ln(3-x) = 5$

(10) $2e^{4x} - 10 = 20$

Factoring: completely factor each of the following

(1) $x^2 - 16$

(2) $x^2 - 5x - 14$

(3) $t^2 - 4t + 3$

(4) $3x^2 - 30x + 27$

(5) $x^4 - 16$

(6) $4x^2 - 4x - 3$

(7) $x^3 - 5x^2 - 6x$

(8) $x^4 - 5x^2 + 4$

(9) $x^4 - 9x^2 + 20$

(10) $e^{2x} - 3e^x + 2$

Simplifying Rational Expressions: completely simplify each of the fol-

lowing

(1) $\dfrac{x^2+3x+2}{x^2-x-2}$

(2) $\dfrac{2x^2-x-1}{x^2-9}\cdot\dfrac{x+3}{2x+1}$

(3) $\dfrac{x^2}{x^2-4}-\dfrac{x+1}{x+2}$

(4) $\dfrac{\frac{y}{x}-\frac{x}{y}}{\frac{1}{y}-\frac{1}{x}}$

(5) $\dfrac{1}{x^2+x}+\dfrac{1}{x}$

(6) $\dfrac{x^3 - 9x}{x^3 - 5x^2 + 6x}$

(7) $\dfrac{\frac{4}{y-3}}{\frac{8}{y^2-9}}$

(8) $\dfrac{4 - \frac{7}{y}}{3 - \frac{2}{y}}$

(9) $\dfrac{\frac{x+h}{x+h+1} - \frac{x}{x+1}}{h}$

(10) $\dfrac{-2\left(x^2-1\right)^2 - (-2x)\left(2\left(x^2-1\right)(2x)\right)}{\left(\left(x^2-1\right)^2\right)^2}$