

SID: _____

Name: _____

Instructions. (69 points) Write out the solutions to the following problems in the space provided below. This assignment covers problems from Sections 1.4-1.6 of the text. Work must be shown to receive credit. Solutions will be graded on mathematical accuracy as well as notation. See the written guidelines in the syllabus. When you are finished upload your finished assignment in Gradescope.

(6^{pts}) **1.** Solve the following equations by factoring.

(a) (3 pts) $29w + 5w^2 = 42$

(b) (3 pts) $w^2 - 11w = -18$

(6^{pts}) **2.** Solve the following equations by using the quadratic formula.

(a) (3 pts) $8y^2 - 2y = 0$

(b) (3 pts) $4w^2 + 2w = 2 - w$

(9^{pts}) **3.** Solve the following equations by completing the square.

(a) (4 pts) $x^2 - 18x - 9 = 0$

(b) (5 pts) $(3t + 4)^2 = 64$

(16^{pts}) 4. Solve the following equations by using an appropriate method.

(a) (4 pts) $(w^2 - 9)^2 + 3(w^2 - 9) - 10 = 0$

(c) (4 pts) $y^4 - 34y^2 - 152 = 0$

(b) (4 pts) $27y^3 + 216 = 0$

(d) (4 pts) $(5x + 2)^{1/3} - 7(5x + 2)^{-2/3} = 0$

- (6^{pts}) **5.** Consider the expression $\frac{y^2 - 2y - 48}{y^3 - 4y^2 - 32y}$
- (a) (4 pts) Simplify the expression.

(b) (2 pts) State any values of the variable for which this function cannot be evaluated.

- (6^{pts}) **6.** Consider the expression $\frac{y^2 + 4y - 21}{y^2 + 2y - 35}$
- (a) (4 pts) Simplify the expression.

(b) (2 pts) State any values of the variable for which this function cannot be evaluated.

- (4^{pts}) **7.** A rock is thrown upward with a velocity of 19 meters per second from the top of a 42 meter high cliff and it misses the cliff on the way back down. When will the rock be 15 meters from the water, below? Round your answer to the nearest hundredth.

- (8^{pts}) **8.** Solve each rational equation

(a) (4 pts) $\frac{2}{x+1} - \frac{x}{x-3} = \frac{3x-21}{x^2-2x-3}$

(b) (4 pts) $\frac{x}{x-1} + \frac{1}{x-4} = \frac{x^2}{x^2-5x+4}$

- (8^{pts}) **9.** Solve each radical equation

(a) (4 pts) $\sqrt{2x^2+8x+1} - x - 3 = 0$

(b) (4 pts) $\sqrt[4]{t^2-t} - \sqrt[4]{t-1} = 0$