

Spring, 1999
Peterson

MATH 124.

Homework 3.

DUE: Friday, February 12.

P1. Solve the following inequalities algebraically, using sign charts if the inequality is a higher inequality. Write final answers in interval notation.

(1) $2(3 - x) - 5(x - 1) < 51 - 2x$.

(2) $|3x - 2| > 7$.

(3) $|2x - 11| - 1 < 14$.

(4) $x^2 - 5x < 14$.

(5) $2x^2 - x \geq 21$.

(6) $3x^3 - 2x^2 - 5x > 0$.

(7) $\frac{x^2 + 3x - 10}{x^2 - x - 6} > 0$.

(8) $\frac{3x}{x - 5} > 1$.

P2. Solve the following by setting up and solving an algebraic equation. Give an English final answer.

- (1) We have 3 gallons of a 20% acid solution and want to add a certain amount of pure acid in order to create a 36% acid solution. How much pure acid do we need to add?
- (2) Going on a trip from town A to town B, Bill traveled at an average speed of 40 mph. Return from town B to town A, along the same route, Bill traveled at an average speed 60 mph. What was Bill's average speed for the round trip?

P3. Find the understood domain of the real function f in each case:

(1) $f(x) = \frac{x}{2x^2 - x - 1}$. (2) $f(x) = \sqrt{x^2 - 11x + 24}$.

P4. Consider the real function f given by $f(x) = -x^2 + 5x + 2$. Find the following:

- (1) $f(3)$.
- (2) $f(-3)$
- (3) $f(-3 + h)$ (Expand and simplify)
- (4) $\frac{f(-3 + h) - f(-3)}{h}$ (Use (2) and (3) results. Then simplify.)

