Homework 3: Due Friday February 17th in recitation. Late homework will not be accepted.

Write on only one side of each page. Staple all work.

1. Rationalize the numerator

$$\frac{\sqrt[3]{x} - \sqrt[3]{x+h}}{h}$$

Hint: Use problem 1 in homework 2.

2. Find all real solutions. If the equation involves fractions and/or radical terms, you must check your final answers.

(a) $x^{4/3} - 5x^{2/3} + 5 = -1$.

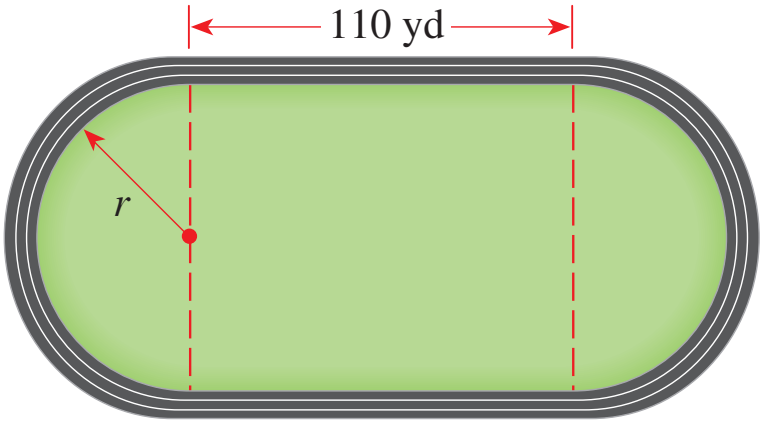
(b) $13x^4 - 26x^2 = -520$.

(c) $\frac{x+5}{x-2} = \frac{5}{x+2} + \frac{28}{x^2-4}$.

3. There is a large pond stocked with fish. The population of fish is given by the formula $P = 3t+10\sqrt{t}+140$. Here t is the number of days since the first were first introduced into the pond. How minutes will it take for the fish population to reach 500?

4. A track has length 440 yards. Assume the straight sides are 110 yards each. Find the radius of the semicircular part in feet. Round your answer to the nearest foot.

Remark: The circumference of a circle of radius r is given by the formula $C = 2\pi r$.



5. A Manufacturer of soft drinks advertise their orange soda as "naturally flavored" although it only contains 5% orange juice. A new federal regulation stipulates that to be called "natural," a drink must contain at least 10% fruit juice. How much pure orange juice must this manufacturer add to their 900 gal of orange soda to conform to the new regulation?

6. Solve the following inequalities and express the solution using interval notation and graph the solution set.

1. $2x - 5 > 3$
2. $4 - 3x \leq -(1 + 8x)$
3. $-2 < 8 - 2x \leq -1$