1. (a) Solve for x, writing your answer as an exact answer in simplest radical form: \((x - 4)^2 - 4 = 8\)

(b) Find \(x\) such that: \(y_1 = \frac{3}{x + 2}; \quad y_2 = \frac{10}{x}; \quad \text{and} \quad y_1 - y_2 = 1\)

2. (a) Divide and simplify: \(\frac{x - 9}{x^2 - 9} + \frac{x^2 - 8x - 9}{x - 3}\)

(b) Find the equation of the line that passes through the points \((4, -3)\) and \((0, 5)\).

3. Simplify as much as possible: (a) \(\sqrt{x^2 + 16} + \left(\frac{k^3}{27}\right)^{\frac{1}{3}}\)  
   (b) \(\frac{4 - \frac{1}{x}}{3 - \frac{5}{x}}\)
4. \( f(x) = \frac{10 - x}{x^2} \) Find: (a) \( f(-x) \) (b) \( f(x - 2) \) [4]

5. (a) Solve for \( t \): \( \frac{1}{r} + \frac{1}{s} = \frac{1}{t} \) [7] (b) Solve for \( x \): \( (7x - 3)^2 - 2 = 6 \) [7]

6. (a) \( f(x) = 6x - 2 \) Find and simplify the difference quotient \( \frac{f(x + h) - f(x)}{h} \), \( h \neq 0 \) [8]

(b) (i) Solve for \( x \): \(-3 < \frac{4 - x}{2} \leq 10\)

(ii) Graph the solution on the number line below:

(iii) Write your answer in interval notation [5-1-1]
7. For the function whose complete graph is shown on the right:
   [3 ea.]
   i. What is the domain?
   ii. What is the range?
   iii. What is the value of $f(-4)$?
   iv. On what interval(s) is the function decreasing?
   v. For what values of $x$ is $f(x) = 0$?

8. A company manufactures and sells blank CD’s. The weekly fixed cost is $800 and it costs $2 to produce each package of CD’s. The selling price is $6 per package. How many packages must be produced and sold each week for the company to generate a profit? Let x represent the number of packages produced and sold. Show all work algebraically.

9. A plot of land is to be divided into 3 corrals. 200 feet of fencing will be used to fence in the corrals. If the area of the plot of land is 1200 sq. ft., determine the length (y) and the width (x) of the plot of land. (Set up a mathematical model and solve algebraically).

***Copy the following pledge and sign your name:***
I pledge on my honor that I have not given or received any unauthorized assistance on this examination.

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Page 3 of 3