Math 150 - Week-In-Review 6

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Problem Statements

1. Solve $t(t^2-3)^{0.5} = t^{1.5}$ for t.

2. Solve for $\dfrac{1}{(2x+1)^{\frac{1}{2}}} + \dfrac{1}{\sqrt{4-x}} = \dfrac{3}{\sqrt{(4-x)(2x+1)}}$

3. Solve the following system of inequalities analytically and check your solutions graphically.

$$\begin{cases} x^2 - 2x > 1 \\ 2x^2 \leq 3 - x \end{cases}.$$

4. Find the intervals where the inequalities are true.
   (a) $t\sqrt{t+1} \geq 5t$

   (b) $2x\,(2x-3)^{-2} \leq 4\,(2x-3)^{-3}$

(c) $x^4 + x^2 \geq \left|x^2 - 2\right| + 3$

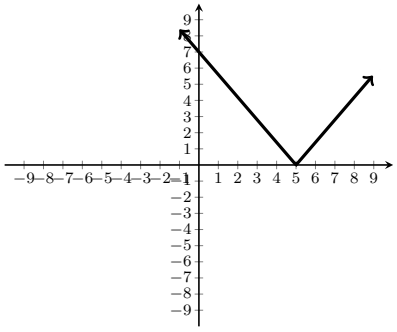
5. Find the inverse function and find its domain and range.
   (a) $g(x) = -2(x+1)^2 + 7$ on $[-1, \infty)$

   (b) $h(x) = x^3 - 7$

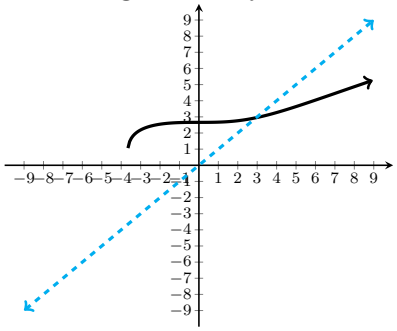
6. Verify whether $f(x) = \dfrac{-3x+4}{x-2}$ and $g(x) = \dfrac{2x+4}{x+3}$ are inverse of eachother.

7. Verify whether $f(x) = \dfrac{4}{x^2-3}$ and $g(x) = \dfrac{x^2-3}{4}$ are inverse of eachother.

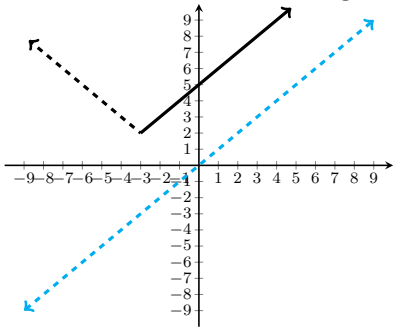
8. For the following graph, determine whether the function has an inverse function on its entire domain. If the answer is no, is it possible to restrict the domain so the function is 1-1?



9. Determine whether the function $g(x) = \sqrt[4]{x^3 + 50}$ has an inverse, and, if it does, find the inverse function algebraically.



10. Determine whether the function $h(x) = |x + 3| + 2$ where $x \geq -3$ has an inverse, and, if it does, find the inverse function algebraically.



11. Determine whether the function $f(x) = \dfrac{4 - 2x}{3x - 5}$ has an inverse, and, if it does, find the inverse function algebraically.