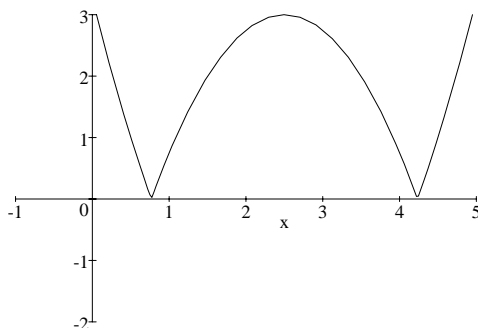


Please show all work and justify all answers on the blank paper provided.

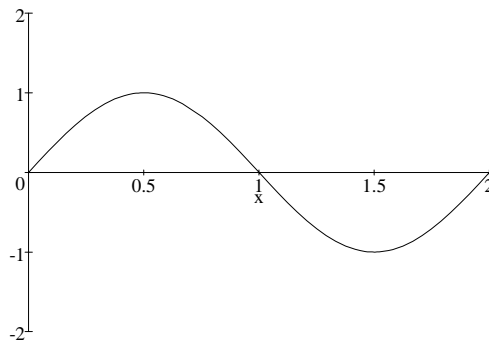
1. Find the domain of the function $g(x) = \sqrt{(2-x)(x+1)}$. You must show a properly labeled sign chart to receive credit.
2. Give an example of an even function that is not constant.
3. Complete the square, then sketch the graph of the quadratic function $q(x) = 9x^2 - 12x + 3$. Your work must show how you determine all x -intercepts, the y -intercept, and the vertex of the graph.
4. Explain how to shift the graph of $y = |x|$ to obtain the graph of $y = |x + 1| - 3$ and then show both graphs.
5. The graph of $y = f(x)$ appears below. Use it to sketch the graph of $y = \frac{1}{f(x)}$ on the same set of axes.



6. Suppose that $f(x) = \sqrt{3+x^2}$ and $g(x) = \sqrt{1-x}$. Find the composition $f \circ g$ and give its domain.

More problems appear on the next page.

7. The graph of $y = g(x)$ appears below. Use the concept of horizontal compression/elongation to sketch the graph of $y = g(2x)$ on the same set of coordinate axes.



8. Let $g(x) = \sqrt{2x - 3}$. Find a formula for $g^{-1}(x)$ and then find the domain and range of $g^{-1}(x)$.
9. Suppose that $P(x)$ is a polynomial function with roots at $x = -2$, $x = 2$, and $x = 3$ (and possibly others). If **both** ends of the graph of $y = P(x)$ point **up**, find a possible formula for $P(x)$.
10. If $P(x) = 2x^4 + 4x^3 - 5x^2 + 3x - 2$ and $D(x) = x^2 + 2x - 3$, find the formulas for $Q(x)$ and $R(x)$ such that $P(x) = Q(x) \cdot D(x) + R(x)$.