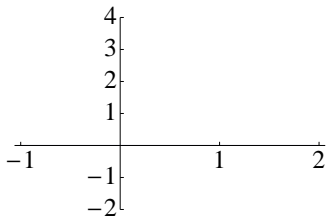
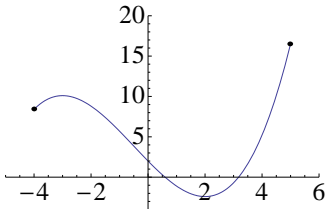


Show work for problems 3 and 5; use the back of the sheet if necessary.

1. (3 points) Sketch a graph of the piecewise function $f(x) = \begin{cases} 2x & \text{if } x < 1 \\ x^2 & \text{if } x \geq 1 \end{cases}$.

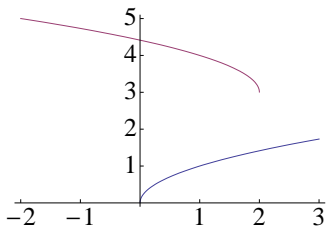


2. (3 points) Identify the intervals on the following graph on which the function graphed is increasing and the intervals on which it is decreasing. Label which is which.



3. (4 points) Determine the average rate of change of the function $g(z) = z^3 - 3z$ between $z = 1$ and $z = 3$.

4. (5 points) The function $f(x) = \sqrt{x}$ is shown on the following graph, along with a function $g(x)$ which is a transformation of \sqrt{x} . Find a formula for $g(x)$.



5. (5 points) Find the vertex, x -intercepts if they exist, and y -intercept of the quadratic $g(x) = 2x^2 + 12x + 10$. Label which is which.