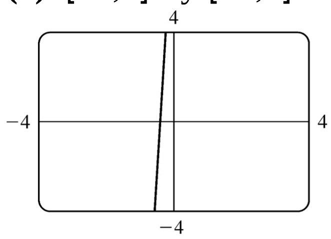
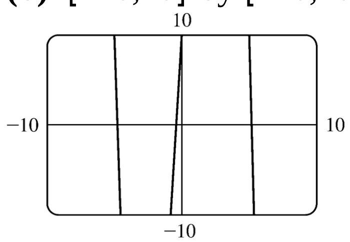
3. $f(x) = 10 + 25x - x^3$

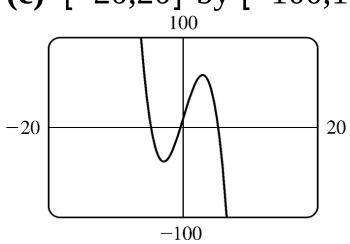
(a) $[-4, 4]$ by $[-4, 4]$



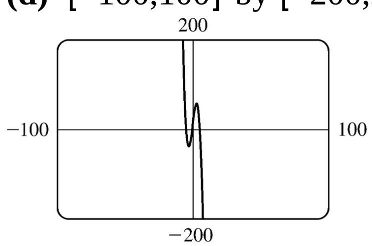
(b) $[-10, 10]$ by $[-10, 10]$



(c) $[-20, 20]$ by $[-100, 100]$

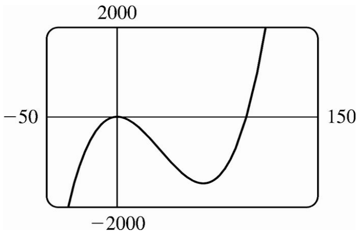


(d) $[-100, 100]$ by $[-200, 200]$

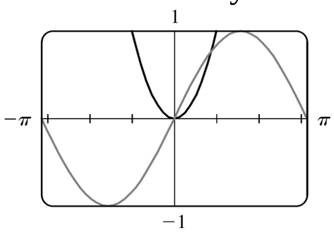


The most appropriate graph is produced in viewing rectangle (c) because the maximum and minimum points are fairly easy to see and estimate.

7. $f(x) = 0.01x^3 - x^2 + 5$. Graphing f in a standard viewing rectangle, $[-10, 10]$ by $[-10, 10]$, shows us what appears to be a parabola. But since this is a cubic polynomial, we know that a larger viewing rectangle will reveal a minimum point as well as the maximum point. After some trial and error, we choose the viewing rectangle $[-50, 150]$ by $[-2000, 2000]$.

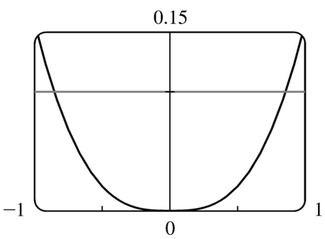


23. We see that the graphs of $f(x)=x^2$ and $g(x)=\sin\ x$ intersect twice. One solution is $x=0$. The other solution of $f=g$ is the x –coordinate of the point of intersection in the first quadrant. Using an intersect feature or zooming in, we find this value to be approximately 0.88. Alternatively, we could find that value by finding the positive zero of $h(x)=x^2-\sin\ x$.



Note : After producing the graph on a TI–83 Plus, we can find the approximate value 0.88 by using the following keystrokes:
2nd CALC 5 ENTER ENTER 1 ENTER . The ``1" is just a guess for 0.88.

27.



We see from the graphs of $y=|\sin\ x-x|$ and $y=0.1$ that there are two solutions to the equation $|\sin\ x-x|=0.1$: $x\approx-0.85$ and $x\approx0.85$. The condition $|\sin\ x-x|<0.1$ holds for any x lying between these two values.

31. $f(x)=x^4+cx^2+x$. If $c<0$, there are three humps: two minimum points and a maximum point. These humps get flatter as c increases, until at $c=0$ two of the humps disappear and there is only one minimum point. This single hump then moves to the right and approaches the origin as c increases.