line specifiers following each pair. For example the command

$$\texttt{plot(x,y,'-b',u,v,'--r',t,h,'g:')}$$

plots y vs. x with a solid blue line, v vs.u with a dashed red line, and h vs. t with a dotted green line.

Sample Problem 5-1:   Plotting a function and its derivatives

Plot the function $y = 3x^3 - 26x + 10$, and its first and second derivatives, for $-2 \le x \le 4$, all in the same plot.

Solution

The first derivative of the function is: $y' = 9x^2 - 26$.
The second derivative of the function is: $y'' = 18x$.
A script file that creates a vector x and calculates the values of y, y', and y'' is:

```
x=[-2:0.01:4];          Create vector x with the domain of the function.
y=3*x.^3-26*x+6;        Create vector y with the function value at each x.
yd=9*x.^2-26;           Create vector yd with values of the first derivative.
ydd=18*x;               Create vector ydd with values of the second derivative.
plot(x,y,'-b',x,yd,'--r',x,ydd,':k')
                        Create three graphs, y vs. x, yd vs. x, and ydd vs. x, in the same figure.
```
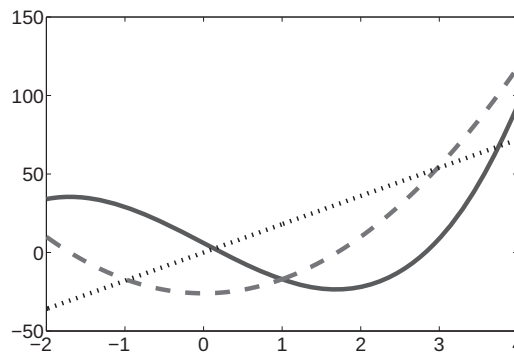
The plot that is created is shown in Figure 5-7.

Figure 5-7: A plot of the function $y = 3x^3 - 26x + 10$ and its first and second derivatives.

5.3.2 *Using the* `hold on` *and* `hold off` *Commands*

To plot several graphs using the `hold on` and `hold off` commands, one graph is plotted first with the `plot` command. Then the `hold on` command is typed. This keeps the Figure Window with the first plot open, including the axis