Math Tasks

1. Find the numerical value of: $\sum_{n=1}^{100} 4n - 3$

Solution:

$$\sum_{n=1}^{100} 4n - 3 = \sum_{n=1}^{100} 4n - \sum_{n=1}^{100} 3 = 4 * \sum_{n=1}^{100} n - \sum_{n=1}^{100} 3$$

Text

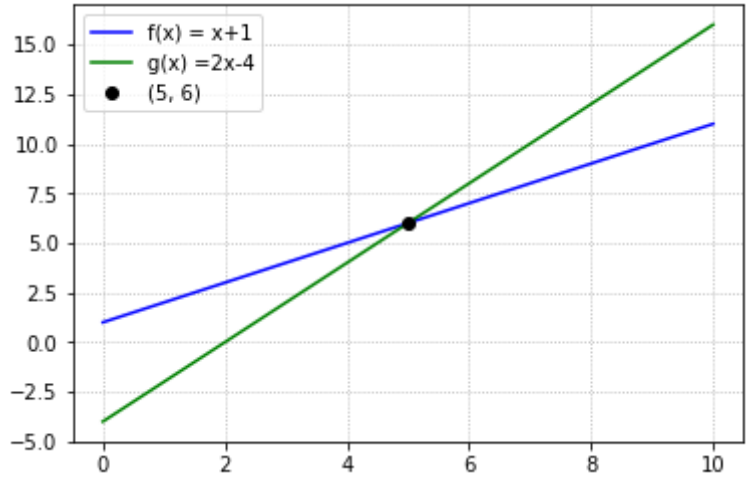
$$= 4 * \frac{(1 + 100) * 100)}{2} - 3 * 100 = 4 * 5050 - 300 = 20200 - 300 = 19900$$

2. Let $f(x) = x + 1$ and let $g(x) = 2x - 4$. Is there a number C with the property that for all $x > C$, we have $g(x) > f(x)$? If so, what is it, and if not, why not?

Solution:

In [46]:
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

x = np.linspace(0, 10, num = 10)
f = x + 1
g = 2*x - 4
plt.plot(x, f, '-b', label = 'f(x) = x+1')
plt.plot(x, g, '-g', label = 'g(x) =2x-4')
plt.plot(5, 6, "ko", label = '(5, 6)')
plt.grid(linestyle = 'dotted')
plt.legend()
plt.show()
```



It can be seen from the plot above that for any $x > 5$, $g(x) > f(x)$.