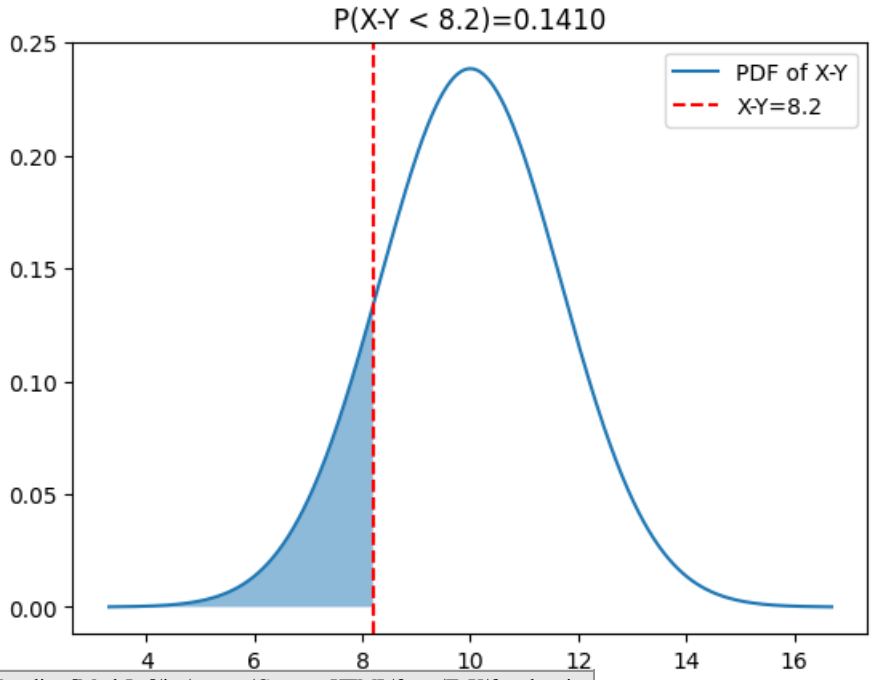
In [1]:

```
# 연습문제 5 p212
from math import sqrt
from scipy.stats import norm

mean1 = 50
var1 = 9
mean2 = 40
var2 = 4

n1 = 5
n2 = 4
mean_diff = mean1 - mean2
std_dev_diff = sqrt(var1 / n1 + var2 / n2)
prob = norm.cdf(8.2, mean_diff, std_dev_diff)

print(f"P(X-Y < 8.2)의 확률: {prob:.4f}")
```

```
P(X-Y < 8.2)의 확률: 0.1410
```

In [2]:

```
# 연습문제 5 p212 + 시각화
import matplotlib.pyplot as plt
import numpy as np
from math import sqrt
from scipy.stats import norm

mean1 = 50
var1 = 9

mean2 = 40
var2 = 4

n1 = 5
n2 = 4

mean_diff = mean1 - mean2
std_dev_diff = sqrt(var1 / n1 + var2 / n2)
x = np.linspace(mean_diff - 4 * std_dev_diff, mean_diff + 4 * std_dev_diff, 1000)
pdf = norm.pdf(x, mean_diff, std_dev_diff)
prob = norm.cdf(8.2, mean_diff, std_dev_diff)

# 그래프 그리기
plt.plot(x, pdf, label="PDF of X-Y")
plt.fill_between(x[x < 8.2], pdf[x < 8.2], alpha=0.5)
plt.axvline(8.2, color="red", linestyle="--")
plt.legend()
plt.title(f"P(X-Y < 8.2)={prob:.4f}")
plt.show()
```



Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js