

習題集 8

(對應 [張旭微積分](#) 微分篇重點八：切線專論)

1. Let $f(x) = \cos x$. Find the tangent line to $y = f(x)$ at $(\frac{\pi}{2}, 0)$.
2. Let $\Gamma: \frac{(x-1)^2}{2} - \frac{(y-1)^2}{8} = 1$. Find the line tangent to Γ at $(3, 1+2\sqrt{2})$.
3. Let $f(x) = x^3 - 7x + 5$ and $P(x_0, f(x_0))$ be a point. If the slope of the tangent line to $y = f(x)$ at P is 5, find x_0 .
4. Suppose that there exists two tangent lines to $f(x) = x^2 - 5x + 7$ passing through P . If the slopes of these two tangent lines are 1 and -1 , find P .
5. Suppose the tangent line to $f(x) = x^6 + x^2 + cx + d$ at $x = 1$ is $y = x + 1$. Find $c + d$.
6. Find all intersections of $f(x) = x^3 - 3x + 1$ and its tangent line at $(1, -1)$.
7. If the tangent line to $f(x) = x^3 + ax^2 + bx + 1$ at $(1, 5)$ has the smallest slope among all tangent lines, find a and b .
8. Find all tangent lines to $f(x) = x^2 - x + 1$ passing through $(2, 2)$.
9. Find the tangent line to the Folium of Descartes $x^3 + y^3 = \frac{9}{2}xy$ at $(2, 1)$.
10. Find the tangent line to the Astroid $x^{\frac{2}{3}} + y^{\frac{2}{3}} = 2$ at $(1, 1)$.

註 如果你寫完了想對答案，可以加入[張旭的生存用微積分社團](#)的單元區取得簡答，如果有任何問題，也可以直接在社團發問；另外，[文哥](#)有拍攝偶數題的講解影片，有需要的同學可以連接到張旭老師YT頻道的[播放清單](#)觀看！