

5. (6 points) The function $\Phi(x)$ is approximated near $x = 0$ by the 4th degree Taylor polynomial:

$$\Phi(x) \approx x - x^2 + 7x^3 - \frac{\pi}{24}x^4$$

a) (3 pts) Calculate $\Phi'''(0)$.

b) (3 pts) Is $\Phi(x)$ concave up, concave down, or neither near $x = 0$? Explain *without* using a graph.