1.

If the tangent line to $y = f(x)$ at $(5, 2)$ passes through $(1, 1)$, find $f(5)$ and $f'(5)$.

2.

Find the derivative of $g(x + f(x))$ at $x = 0$ given the following information:

x	f(x)	g(x)	f′(x)	g′(x)
-1	0	-1	2	1
0	-1	-3	-2	4

3.

Find the 2nd derivative of the function.

$$y^2 + 2y = 2x + 1$$

4.

Find the derivative of the function.

$$f(x) = 4t^3 - 5e^t$$

5.

Find the derivative of the function.

$$y = \frac{\sqrt{x} - 1}{\sqrt{x} + 1}$$

6.

Find f'

$$f(\theta) = \tfrac{1}{2}\, e^{\sin(2\theta)}$$

7. **The graph of the equation $y^2 = 5x^4 - x^2$ is called a Kampyle of Eudoxus. (Such curves were first studied by the Greek mathematician Eudoxus of Cnidus, born in 408 BC.)**

Use implicit differentiation to find the equation of the tangent to this curve at the point (1, 2).

8.

Find the first and second derivatives of the function.

$$g(s) = s^2 \cos s$$

9.

Find $\frac{dy}{dx}$

$y = x(x+3)^5 \ln x$

10.

Find $\frac{dy}{dx}$

$y = \frac{2}{\sqrt{4-3x}}$

11.

Find f' if

$f(x) = x^2 \arctan(5x)$

12.

Find the derivative of

$y = \frac{1}{2}\csc(2x)$

at $\left(\frac{\pi}{4}, \frac{1}{2}\right)$