

12. The partial derivative with respect to x is found by treating all other variables as constants. Therefore, all terms that do not contain x have zero derivatives.

$$\begin{aligned} \frac{\partial f}{\partial x} &= 2xy^3 + y^4 + \cos x + 2 \cos x(-\sin x) \\ &= (2x + y)y^3 + (1 - 2 \sin x)\cos x \end{aligned}$$

The answer is (D).

13. From the table of derivatives,

$$\begin{aligned} \mathbf{D}(f(x))^{g(x)} &= g(x)(f(x))^{g(x)-1} \mathbf{D}f(x) \\ &\quad + (\ln f(x))(f(x))^{g(x)} \mathbf{D}g(x) \\ f(x) &= 2x \\ g(x) &= x \\ \frac{d(2x)^x}{dx} &= x(2x)^{x-1}(2) + (\ln 2x)(2x)^x(1) \\ &= (2x)^x \cancel{2} + (2x)^x \ln 2x \\ &= (2x)^x \cancel{2} + \ln 2x \end{aligned}$$

The answer is (A).

replace with "1"