

1. Calculate the following derivatives $f'(a)$ for the given f and a :

(a) $f(x) = x^2 + 3x + 1$, $a = 2$

(b) $f(x) = 4x - 1$, $a = -3$

(c) $f(x) = (x - 100)^5 + (x - 100)^2 + (x - 100) - 5$, $a = 100$

(d) $f(x) = (x + 3)^{10} - 4x + 5$, $a = -3$

2. Given the following values of $f(a)$ and $f'(a)$, approximate $f(a + 1)$:

(a) $f(2) = 4$, $f'(2) = 8$

(b) $f(1) = 0$, $f'(1) = 0$

(c) $f(5) = 21$, $f'(5) = -30$

(d) $f(-8) = -5$, $f'(-8) = 2$