One dimensional Dirac Delta function - part 1

Evaluate the following integrals

$$I_1 = \int_1^5 (3x^2 - x + 2)\delta(x-3)dx \qquad [I_1 = 26]$$

$$I_2 = \int_0^4 \sin x \delta\left(x - \frac{\pi}{2}\right) dx \qquad [I_2 = 1]$$

$$I_3 = \int_0^5 (3x^2 - 1)\delta(x+2) \qquad [I_3 = 0]$$

$$I_4 = \int_{-\infty}^{+\infty} \ln(x+5)\delta(x+4)dx \qquad [I_4 = 0]$$

One dimensional Dirac Delta function - part 2

Evaluate the following integrals

$$I_1 = \int_{-2}^2 (2x+1)\delta(2x)dx \qquad \left[I_1 = \frac{1}{2}\right]$$

$$I_2 = \int_0^2 (2x^3 - 4x + 5)\delta(1-x)dx \qquad [I_2 = 3]$$

$$I_3 = \int_{-2}^2 7x^2\delta(2x+1)dx \qquad \left[I_3 = \frac{7}{8}\right]$$

$$I_4 = \int_{-\infty}^c \delta(x-a)dx \qquad [I_4 = 1 \quad \text{if} \quad a < c\,; \quad I_4 = 0 \quad \text{if} \quad a > c]$$