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1) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$
 where $f(x)$ is a continuous function at $x=a$.
 For example, $\int_{-\infty}^{\infty} x \delta(x-2) dx = 2$.
 Also, $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 The Dirac delta function is defined by the properties:
 1) $\delta(x) = 0$ for $x \neq 0$.
 2) $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 3) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$.
 4) $\int_{-\infty}^{\infty} f(x) \delta(x) dx = f(0)$.

2) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$
 where $f(x)$ is a continuous function at $x=a$.
 For example, $\int_{-\infty}^{\infty} x^2 \delta(x-3) dx = 9$.
 Also, $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 The Dirac delta function is defined by the properties:
 1) $\delta(x) = 0$ for $x \neq 0$.
 2) $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 3) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$.
 4) $\int_{-\infty}^{\infty} f(x) \delta(x) dx = f(0)$.

3) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$
 where $f(x)$ is a continuous function at $x=a$.
 For example, $\int_{-\infty}^{\infty} x^3 \delta(x-4) dx = 64$.
 Also, $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 The Dirac delta function is defined by the properties:
 1) $\delta(x) = 0$ for $x \neq 0$.
 2) $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 3) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$.
 4) $\int_{-\infty}^{\infty} f(x) \delta(x) dx = f(0)$.

4) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$
 where $f(x)$ is a continuous function at $x=a$.
 For example, $\int_{-\infty}^{\infty} x^4 \delta(x-5) dx = 625$.
 Also, $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 The Dirac delta function is defined by the properties:
 1) $\delta(x) = 0$ for $x \neq 0$.
 2) $\int_{-\infty}^{\infty} \delta(x) dx = 1$.
 3) $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$.
 4) $\int_{-\infty}^{\infty} f(x) \delta(x) dx = f(0)$.

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