







Figure 1 consists of two horizontal bar charts. The top chart represents the distribution for 1990, and the bottom chart represents the distribution for 2000. The x-axis for both charts represents the number of children per woman, ranging from 0 to 6. The y-axis represents the percentage of women. The bars are color-coded: black for 0 children, dark gray for 1 child, medium gray for 2 children, light gray for 3 children, and white for 4 or more children. In 1990, the distribution is heavily skewed towards 0 and 1 child, with a significant portion of women having 0 or 1 child. By 2000, the distribution has shifted, with a larger proportion of women having 2 or 3 children, and a smaller proportion having 0 or 1 child.

A pixelated, grayscale image of a sword, likely a rapier or foil, oriented vertically. The blade is long and tapers to a point, with a crossguard visible near the hilt. The image is composed of a grid of squares in various shades of gray, giving it a low-resolution, digital-art appearance.

A 15x15 grayscale pixelated image of a stylized letter 'A'. The 'A' is formed by dark gray and black pixels, with a lighter gray background. The top bar of the 'A' is composed of several black and dark gray pixels. The two vertical strokes are also made of dark gray and black pixels, with some lighter gray pixels interspersed. The bottom of the 'A' is a wide base made of dark gray and black pixels. The overall style is reminiscent of early digital art or a low-resolution scan of a printed letter.

A large, pixelated, grayscale image of a vertical line, possibly representing a stylized letter or a barcode. The image is composed of many small squares, each with a different shade of gray, creating a jagged, digital appearance. The line is roughly vertical but has a slight curve and some horizontal segments, giving it a unique, abstract look.

$$f'(z) = \frac{dw}{dz}$$





$$= \frac{\partial v}{\partial x} + \frac{\partial v}{\partial x}$$

dw

Figure 1 consists of two horizontal bar charts. The top chart is for 'Strongly agree' and the bottom chart is for 'Disagree'. Each chart has two bars: a dark grey bar for 'Total' and a lighter grey bar for 'Non-Black'. The x-axis represents the percentage of respondents, ranging from 0 to 100. The y-axis lists the levels of agreement: 'Strongly agree' and 'Disagree'.

Level of Agreement	Total (%)	Non-Black (%)
Strongly agree	~85	~75
Disagree	~15	~25

$$dz$$

$$v(t) = \frac{dx}{dt} + i \cdot \frac{dv}{dt}$$

$$\int_a^b (v(t)) \, dt = \int_a^b (v) \, dt + i \cdot \int_a^b (v) \, dt$$

$$\int_a^b$$

$$(v(t))\,dt$$

$$=$$

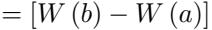
$$[W(t)]^b_a$$





$$(v(t)) \, dt$$

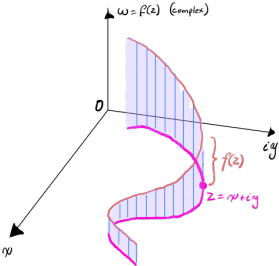
$$= \int_0^1 \int_0^1 \left(\frac{1}{2} + \frac{1}{2} \cos(2\pi x) \right) dx dy$$

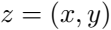




$$\lim_{n \rightarrow \infty} \left(\sum_{i=1}^n \left[f(z_i^*) \cdot \Delta z \right] \right)$$









Handwritten text in a cursive script, likely a signature or a name, rendered in a pixelated, black and white style. The text is written on a white background and consists of several connected, flowing characters.













$$\oint_C f(z) dz$$

$$\int_C f(z) \, dz = \int_{z_1}^{z_2} f(z) \, dz$$

$$\int_a^b f(z) dz = \int_a^b (f[z(t)] \cdot z'(t)) dt$$



$$\int_C (f(z)) dz$$

$$= \int_{-b}^{-a} \left(f[z(-t)] \cdot \frac{d}{dt} (z(-t)) \right) dt$$

$$= - \int_a^b (f[z(-t)]z'(-t))dt$$

$$= - \int_C \varphi(z) \, dz$$

$$\oint f(z) dz$$

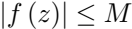




$$\int (v(t)) \, dt$$

$$\int_{-\infty}^{\infty} |w(t)| dt$$





$$\left| \int (f(z)) \, dz \right| \leq M \cdot I$$



$$\oint_C \left(1 - \frac{1}{z} \right) dz$$



$$= \int_{-\pi}^{\pi} \left(\frac{1}{e^{i\theta}} \cdot \frac{d}{d\theta} (e^{i\theta}) \right) d\theta$$

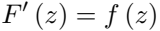
$$= \int_{\pi}^{\pi} \left(\frac{1}{e^{i\theta}} \cdot i \cdot e^{i\theta} \right) d\theta$$

$$= \int_{\pi}^{\pi} (z) d\theta$$







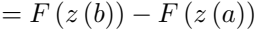


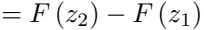


$$\int_C f(z) \, dz = \int_{z_1}^{z_2} f(z) \, dz = [F(z)]_{z_1}^{z_2}$$

$$= \int_a^b f(z(t)) \, dt$$

$$= \int_a^b u(z(t)) dt + i \cdot \int_a^b b(z(t)) dt$$







$$= \int_0^1 \int_0^1 \left(\frac{1}{2} + \frac{1}{2} \cos(2\pi x) \cos(2\pi y) \right) dx dy$$

= [00] [00] [00]

A pixelated, grayscale image of a stylized letter 'F' or a similar abstract shape. The shape is composed of many small squares, with the central vertical bar being the darkest (black) and the horizontal bars being lighter shades of gray. The overall effect is a low-resolution, digital art style.

A pixelated, grayscale image of the number 5. The number is rendered in a style that looks like a low-resolution digital font or a heavily dithered graphic. The pixels are arranged in a way that creates a sense of depth and texture, with darker shades of gray forming the main body of the number and lighter shades creating highlights and shadows. The overall effect is reminiscent of a vintage computer screen or a low-quality digital scan.

A pixelated, grayscale image of a stylized letter 'A' or '4'. The character is composed of a grid of squares in various shades of gray, set against a white background. The shape is blocky and abstract, resembling a digital or low-resolution font.

A pixelated, black and white representation of the number 9, rendered in a stylized, blocky font. The number is composed of a grid of black and white pixels, giving it a digital or retro aesthetic. The shape is a simple, rounded '9' with a small loop at the bottom. The background is white, and the number is centered horizontally.

=

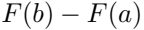
14

20

10



$$\oint_C f(z) \, dz = 0$$





$$\int_C f(z) \, dz + \sum_{n=1}^k \left[\int_{C_n} f(z) \, dz \right]$$

$$\int_{C_1} f(z) dz + \int_{C_2} f(z) dz$$

$$\int_{C_1} f(z) dz - \int_{C_2} f(z) dz$$

$$\oint_{C_1}$$

$$f(z) dz$$

$$= \int_{C_2} f(z) \, dz$$





$$\oint_{|z-z_0|=r} (z-z_0)^n \, dz = \begin{cases} 0 & \text{if } n \neq -1 \\ 2\pi i & \text{if } n = -1 \end{cases}$$

$$\int_{|z|=1} \frac{1}{z^2 + 2z + 2} dz$$

$$= \int_{|z|=1} \frac{1}{(z + (1 + i)) \cdot (z + (1 - i))} dz$$





$$\oint_C \frac{f(z)}{z - z_0} dz = 2\pi i \cdot f(z_0)$$

$$\int_{|z|=1} \frac{\cos z}{z^3 + 9z} dz$$

$$\int_{|z|=1} \frac{\cos z}{z^3 + 9z} dz = \int_{|z|=1} \frac{1}{z} \cdot \frac{\cos z}{z^2 + 9z} dz$$

code 2



2 + 2









1992

—

COBOL
2010

$$\int_{|z|=1} \frac{\frac{\cos z}{z^2+9}}{(z-0)} dz$$

$$= 2\pi i \cdot \frac{\cos(0)}{0^2 + 9}$$

$$= e^{-\frac{1}{2}}$$

$$\frac{2\pi}{9}$$

$$\int_C \frac{f(z)}{(z-z_0)^{n+1}} dz = f^{(n)}(z_0) \cdot \frac{2\pi i}{n!}$$

The derivative is defined as:

$$\frac{dy}{dx} = \lim_{\Delta x \rightarrow 0} \left(\frac{\Delta y}{\Delta x} \right) = \lim_{h \rightarrow 0} \left(\frac{f(x+h) - f(x)}{h} \right) = \lim_{x \rightarrow a} \left(\frac{f(x) - f(a)}{x - a} \right)$$

a function will be differentiable at a if $\frac{dy}{dx} \Big|_{x=a}$ exists

if a function is differentiable at a it must hence be continuous

if the derivative is a continuous function, the derivative will exist for all x .

A continuous function will be
any function:

$$\lim_{x \rightarrow a} (f(x)) = f(a) \quad \forall x \in \mathbb{R}$$

This can be restated as 3 statements that are, in conjunction, equivalent

all of these must be satisfied

1. $f(a)$ exists

2. $\lim_{x \rightarrow a} (f(x))$ exists \rightarrow this implies:

3. $\lim_{x \rightarrow a} (f(x)) = f(a)$

$$\begin{aligned} \lim_{x \rightarrow a} (f(x)) &\text{ exists} \\ \lim_{x \rightarrow a} (f(x)) &\text{ exists} \\ \lim_{x \rightarrow a} (f(x)) &= f(a) \end{aligned}$$

The derivative value of some function at some x -value is the limit of the slope of the secant line from x to $(x+\Delta x)$ as Δx approaches zero.