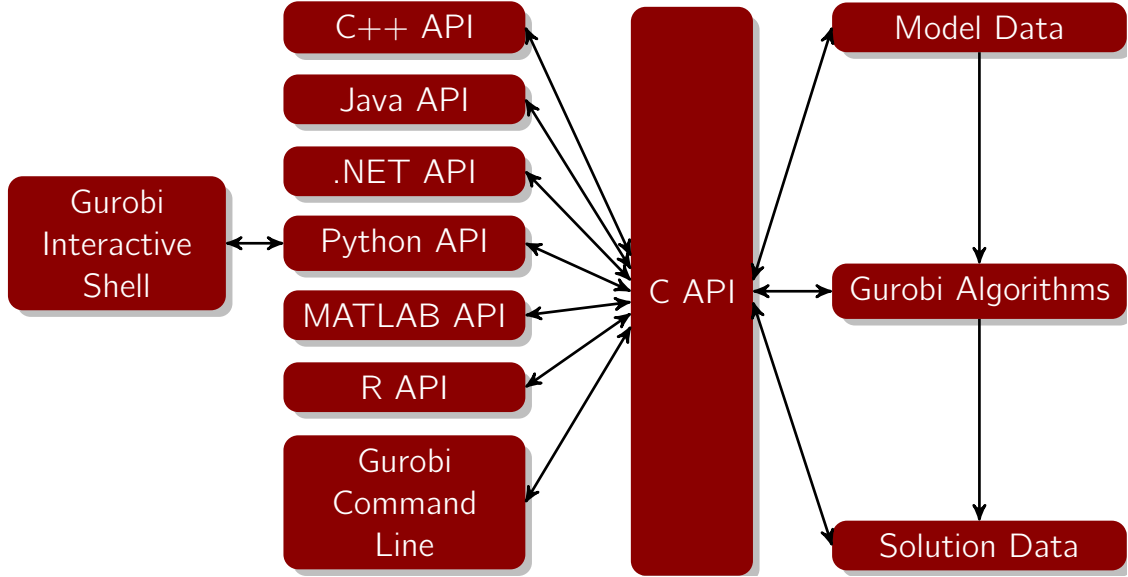




GUROBI

OPTIMIZATION



www.xiaozhuang.com

Wiederholungsfragen

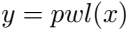


A pixelated, black and white representation of the text "WAVE 2020". The letters are composed of various shades of gray and black pixels, giving it a retro, digital appearance. The font is a clean, sans-serif style. The word "WAVE" is followed by a space, then "2020". The entire image is set against a plain white background.

1992-93



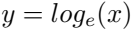


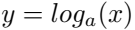


$$v = p_0 x^2 + p_1 x - 1 + \dots + p_n x$$

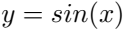




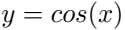


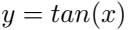


















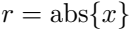












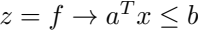


Handwritten text in a cursive script, likely a signature or name, rendered in grayscale. The text is highly stylized and appears to be a single word or a short phrase, possibly "Handwritten" or "Signature".













1011













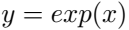




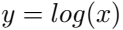






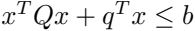












2023 + 2023 = 4046













































$\sin(x) + \cos(x) = \sqrt{2} \sin\left(x + \frac{\pi}{4}\right)$

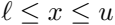








$x^2 + x + 1$







1999

$x \left[ \frac{1}{2} \right] = \frac{1}{2} x \left[ \frac{1}{2} \right]$





$x_{\text{rev}} = x_{\text{cor}, x_{\text{rev}}}$

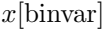


2023-2024

$x_{\text{inv}} = x_{\text{inv}}^{\text{inv}}$

$x_{\text{var}} = \text{ord}(\text{var})$

$$x[bivar] = bivar(x(v)) \text{ set the}$$





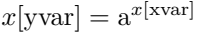
val[ val ] val



www.wwi.org

$$x[\text{var}] = p_0 x[\text{var}]^d + p_1 x[\text{var}]^{d-1} + \dots + p_{d-1} x[\text{var}] + p_d$$

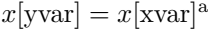
www.arp.org

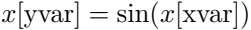


100% 100% 100%

$$x \log(x) = \log(x) x$$







2023-2024

*var[1] = val[1]*

*odjB odjV odj*



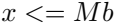






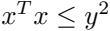


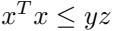






32 + 52 = 10













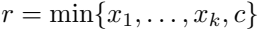
2021-2022-2023

www.xp2xp.com

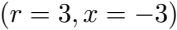


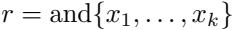


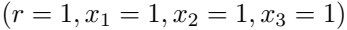






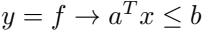






Handwritten text: "The end of the world is near"













2012-2012

$$r = x_j + s_j \quad \text{for all } j = 1, \dots, k$$

$$r = c + s_{k+1}$$

$$z_1 + \dots + z_{k+1} = 1$$

$$SOS1(s_j, z_j) \quad \text{for all } j = 1, \dots, k + 1$$

$$s_j \geq 0 \quad \text{for all } j = 1, \dots, k + 1$$

$$z_j \in \{0, 1\} \quad \text{for all } j = 1, \dots, k + 1$$

Waxing and Waning



www.xixixi.com

2013









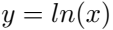




$r \geq x_j$  for all  $j = 1, \dots, k$

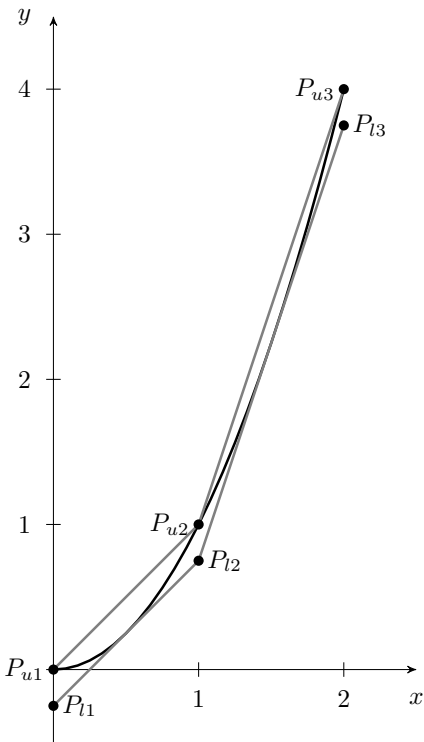
$r \geq c$

$$x^n + x^{n-1} + \dots + x + 1$$















Pravda, pravda, pravda,

*P1025, P21075, P22375*





















100% 100%

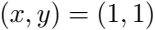


2020













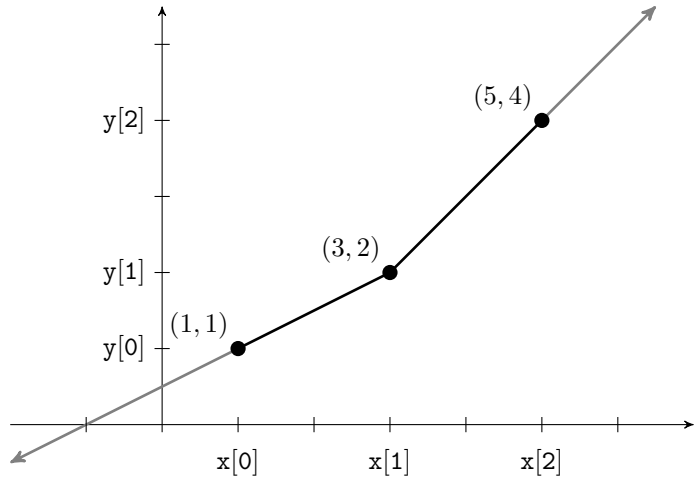












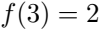












150 = 1

101010

100005

$$\begin{aligned}
 & \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right] = \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right] \cdot \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right] \\
 & \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right] = \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right] \cdot \left[ \begin{array}{c} \mathbf{X} \\ \mathbf{Y} \end{array} \right]
 \end{aligned}$$

$$f(v) = \begin{cases} y_1 + \frac{y_2 - y_1}{x_2 - x_1} (v - x_1), & \text{if } v \leq x_1, \\ y_i + \frac{y_{i+1} - y_i}{x_{i+1} - x_i} (v - x_i), & \text{if } v \geq x_i \text{ and } v \leq x_{i+1}, \\ y_n + \frac{y_n - y_{n-1}}{x_n - x_{n-1}} (v - x_n), & \text{if } v \geq x_n. \end{cases}$$

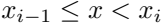


$$(x-1, y-1), (x+1, y+1), (x-1, y+1), (x+1, y-1)$$



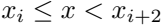


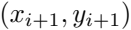


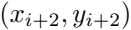


1991-1992







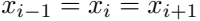


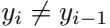




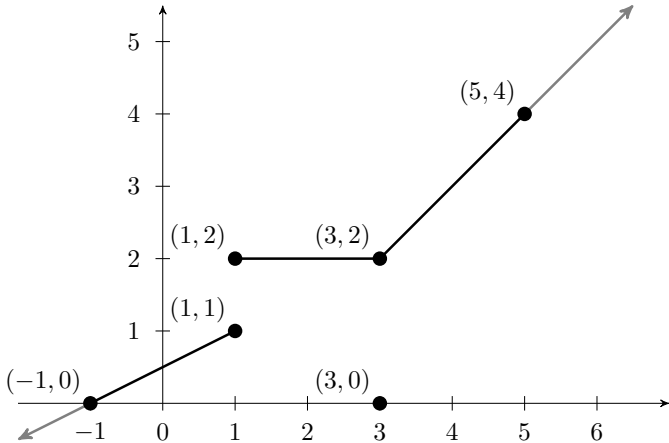


$$(x_2, x_2), (x_1, x_1), (x_2, x_1), (x_1, x_2), (x_2, x_2)$$







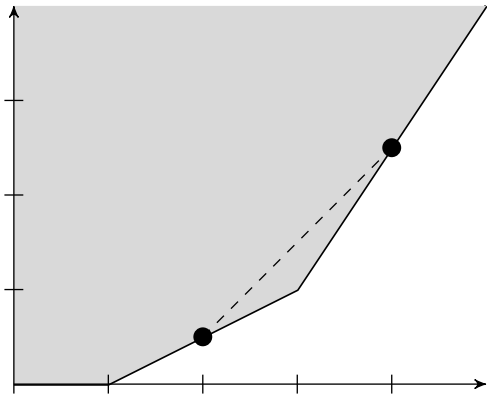


(-1, 0, 1, 2, 3, 0, 1, 2, 3, 0, 1, 2)

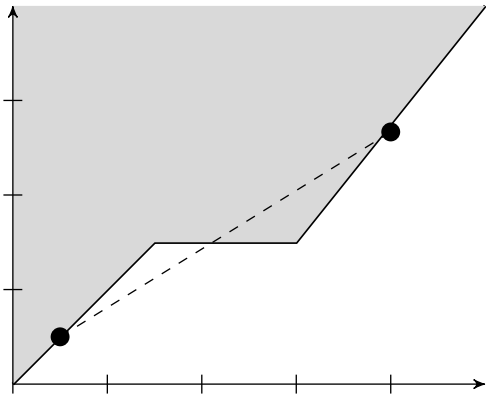




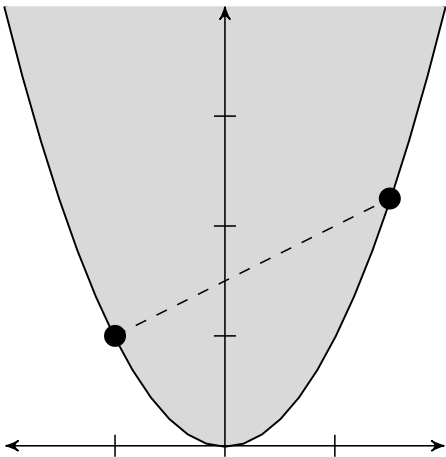








3x2 + 4x2 + 2x2 + 2x2 + 2x2









$$\bar{a}x = \lambda^t Ax \leq \lambda^t b = -\beta + \sum_{j: \bar{a}_j < 0} \bar{a}_j U_j + \sum_{j: \bar{a}_j > 0} \bar{a}_j L_j,$$

























minimize  $c'x$

subject to  $Ax \geq b$

$x \geq 0$

$$\begin{array}{ll}
 \text{maximize} & b'y \\
 \text{subject to} & A'y \leq c \\
 & y \geq 0
 \end{array}$$























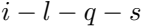








































$$(10x01^2+2x01x02+2x02x01+2x02^2)/2$$



A horizontal sequence of 12 grayscale images showing the progression of a handwritten digit '4' being drawn on a white background. The sequence starts with a single vertical stroke and gradually adds horizontal and diagonal strokes until the digit is fully formed. The images are arranged in a single row, separated by small gaps, showing the step-by-step construction of the digit.

A pixelated, grayscale image of a stylized, symmetrical figure. The figure has a central vertical axis and is composed of various shades of gray and black pixels. It appears to be a character or a logo, rendered in a low-resolution, blocky style. The figure is symmetrical, with a central vertical axis. The top part of the figure is wider and flares out, while the bottom part is narrower and tapers off. The overall shape is reminiscent of a stylized 'Y' or a character with outstretched arms and legs. The image is composed of many small squares, each representing a pixel. The colors are in shades of gray, ranging from light gray to black. The background is white. The figure is centered in the image. The overall style is reminiscent of early computer graphics or pixel art.

A large, pixelated, grayscale letter 'O' centered on a white background. The letter is composed of many small squares in various shades of gray, creating a blocky, digital appearance. The 'O' is roughly circular with a thick border and a white center.

A 15x15 grayscale pixelated image of a stylized letter 'C'. The letter is formed by a thick, blocky stroke. The pixels are in various shades of gray, from light to dark, creating a textured, almost 3D effect. The 'C' is positioned in the center of the frame, with its top and bottom curves clearly defined by the pixelated edges. The background is white, and the overall style is reminiscent of early digital art or a low-resolution scan of a printed character.

$$\begin{array}{ll}
\text{minimize} & y - 1.3x(1 - z) + (1 - z) \\
\text{subject to} & 2y - 3x + 1.7w = 1.7 \\
& -y + x + xz(1 - v) \geq 0 \\
& -y \leq 0, \\
& v, w, x, y, z \in \{0, 1\}.
\end{array}$$









$$1 - (1 + x + x^2)(x + x^2) = 1 - x + x^2$$

100







$$\text{base\_value} = \max\{\text{bestsol}, \text{bestbd} + \text{gap}, \text{bestbd} + \text{agg}\}$$















12345

100100050001



0123

$\ln 2 \approx 0.693147$

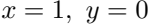
$$x - 6y = 1$$

$$0.333x - 2y = .333$$

0501050105

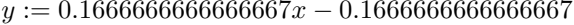
$$x - 6 \cdot (0.1665x - 0.1665) = 1$$

$$\Leftrightarrow 0.001x = 0.001$$



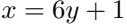
$$x - 6y = 1$$

$$0.3333333333333333x - 2y = 0.3333333333333333$$





$$\begin{aligned}
 x - 6 \cdot (0.16666666666666667x - 0.16666666666666667) &= 1 \\
 \Leftrightarrow 2 \cdot 10^{-16}x + 1 + 2 \cdot 10^{-16} &\approx 1
 \end{aligned}$$











$$\min \quad 0$$

$$s.t. \quad x \leq 0$$

$$x \geq 10^{-10}$$











we are 100% 100%





$\left( \frac{1}{2} \ln \frac{1+x}{1-x} \right) = \frac{1}{2} \ln \frac{1+x}{1-x}$











Handwritten text: *Handwritten text: 10/10/10*







1000





$\frac{d}{dx} \left( x^2 + 1 \right) = 2x$



$$\begin{array}{rcl}
 10^{-7}x + 10y & \leq & 10 \\
 x + 10^4z & \leq & 10^3 \\
 x, y, z & \geq & 0,
 \end{array}$$

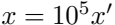
10-7 10-1

105

$$10^{-2}x' + 10y \leq 10$$

$$10^2x' + 10z \leq 1$$

$$x', y, z \geq 0,$$





10-2010-2

100-3 1001

$$\begin{aligned}
 x - 10^6 y &\geq 0 \\
 y &\in [0, 10]
 \end{aligned}$$

$$x - 10y_1 \geq 0$$

$$y_1 - 10y_2 = 0$$

$$y_2 - 10y_3 = 0$$

$$y_3 - 10y_4 = 0$$

$$y_4 - 10y_5 = 0$$

$$y_5 - 10y = 0$$

$$y \in [0, 10]$$

A pixelated, black and white graphic of the text "100% 2011". The characters are rendered in a bold, blocky font with a dithered or pixelated texture. The "100" is on the left, followed by a percentage sign, then "2011" on the right. The overall style is reminiscent of early digital art or video game titles.

$$x - 10^3 y' \geq 0$$

$$y' \in [0, 10^4]$$

10-23-2020







$$x \leq 10^6 y$$

$$x \geq 0$$

$$y \in \{0, 1\},$$

WELCOME TO THE



$$x \leq 10^3 y$$

$$x \geq 0$$

$$y \in \{0, 1\}$$





100



$$6 \cdot 10^6 / 0.00099 = 6.0606 \cdot 10^9$$



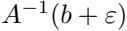














$$\|b, e\| = \frac{\|A^{-1}b\|}{\|A^{-1}(b+e)\|} \leq \frac{\|b\|}{\|b+e\|}.$$

W.A. = Waxweasel

$\pi(A)$

$=$

$\lambda_1 \lambda_2 \lambda_3$





no A)

=

AA-1

100%





max

$cx$

s.t.

$Ax \leq b.$

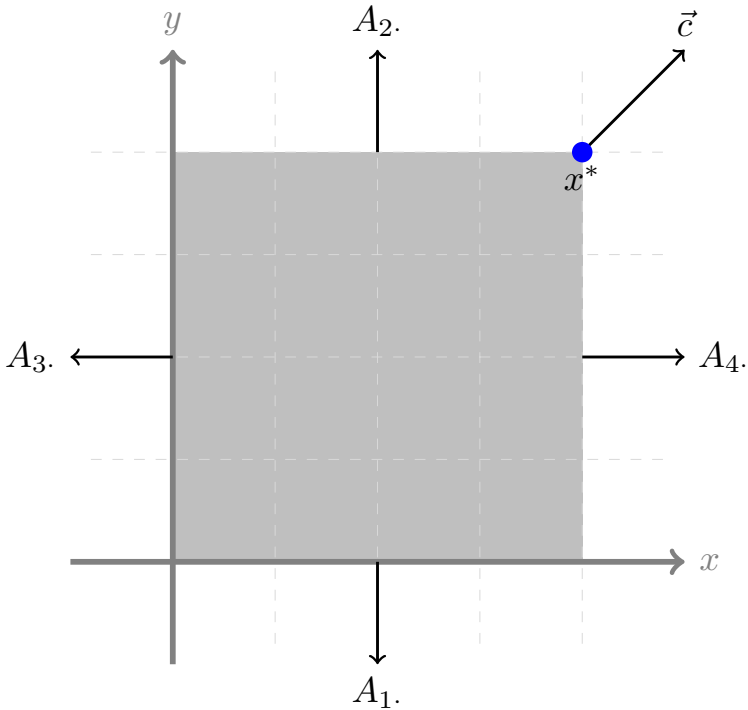
$$\begin{array}{llll}
 \max & x + y & \vec{c} = & (1, 1) \\
 s.t. & -x \leq 0 & A_1. = & (-1, 0) \\
 & x \leq 1 & A_2. = & (1, 0) \\
 & -y \leq 0 & A_3. = & (0, -1) \\
 & y \leq 1 & A_4. = & (0, 1).
 \end{array}$$



Waxen waxen  
waxen waxen  
waxen waxen











for 10,000

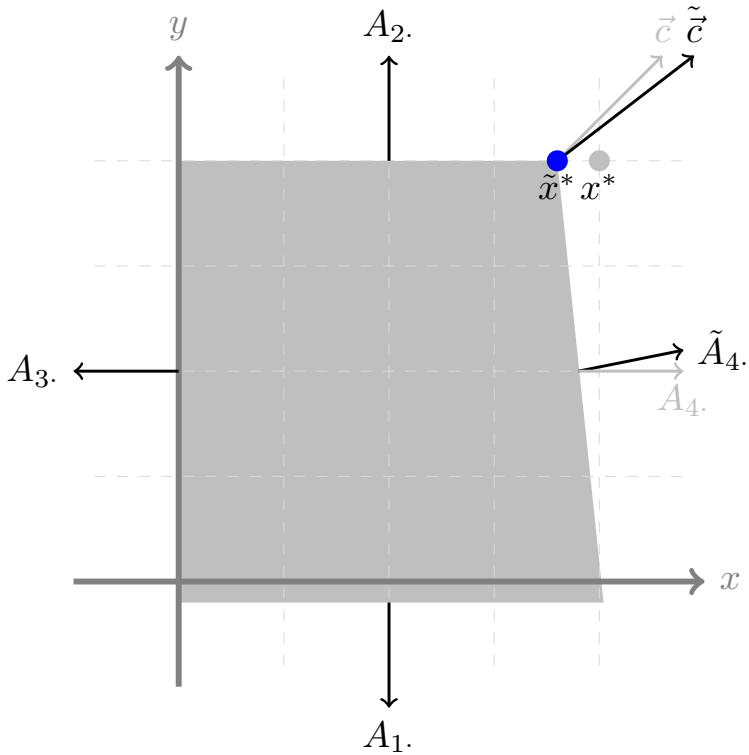


100

100

100

100



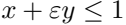




100%



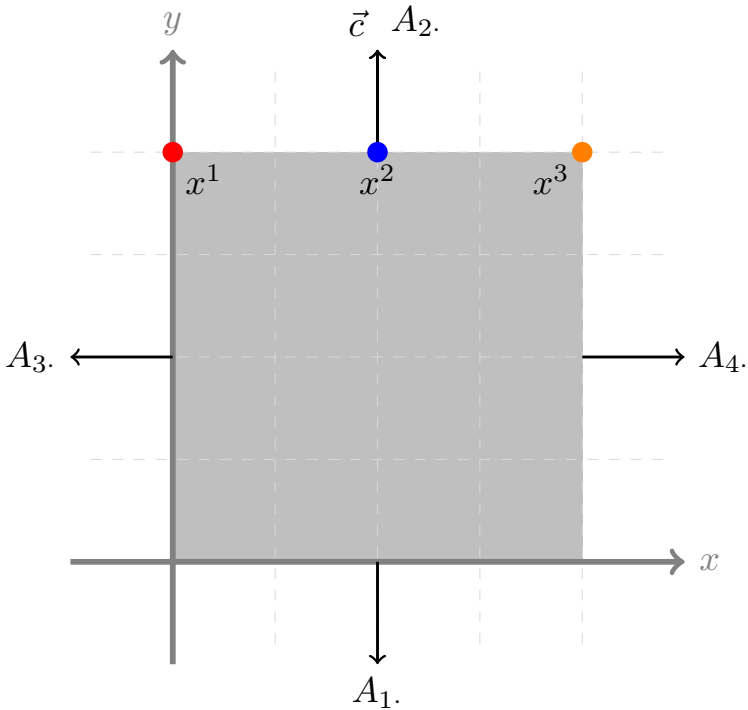
100%





A pixelated, black and white graphic of the text "100% + 50% = 150%". The text is rendered in a bold, blocky font with a dithered or pixelated appearance. The characters are composed of various shades of gray and black pixels. The plus sign is a simple cross shape. The equals sign is a horizontal line. The percentage signs are represented by the symbols '%' and '%'. The overall style is reminiscent of early digital art or low-resolution computer graphics.

$$\begin{array}{llll}
 \max & & y & \vec{c} = (0, 1) \\
 s.t. & -x \leq 0 & A_1. = & (-1, 0) \\
 & x \leq 1 & A_2. = & (1, 0) \\
 & -y \leq 0 & A_3. = & (0, -1) \\
 & y \leq 1 & A_4. = & (0, 1).
 \end{array}$$

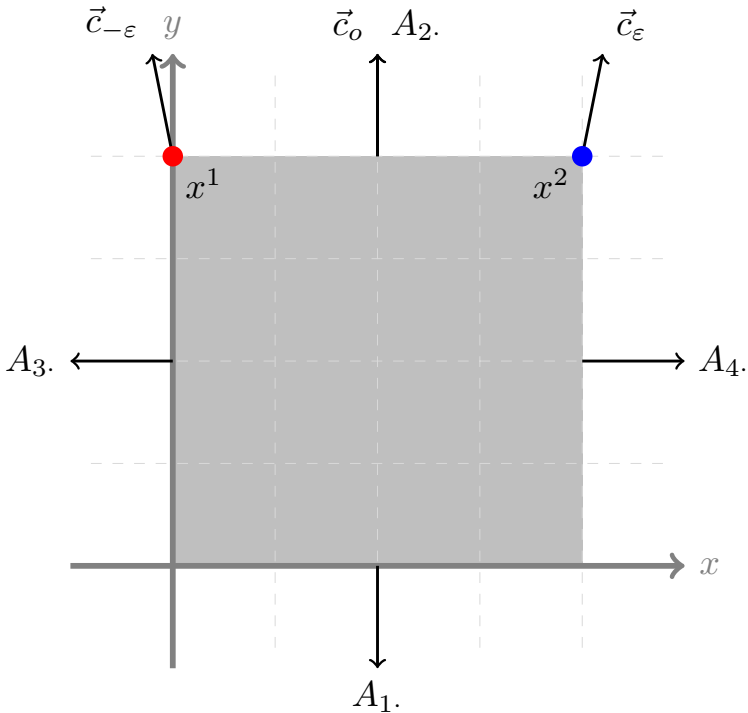








$$\begin{array}{llll}
\max & \varepsilon x + y & \vec{c} = & (\varepsilon, 1) \\
s.t. & -x \leq 0 & A_1. = & (-1, 0) \\
& x \leq 1 & A_2. = & (1, 0) \\
& -y \leq 0 & A_3. = & (0, -1) \\
& y \leq 1 & A_4. = & (0, 1).
\end{array}$$







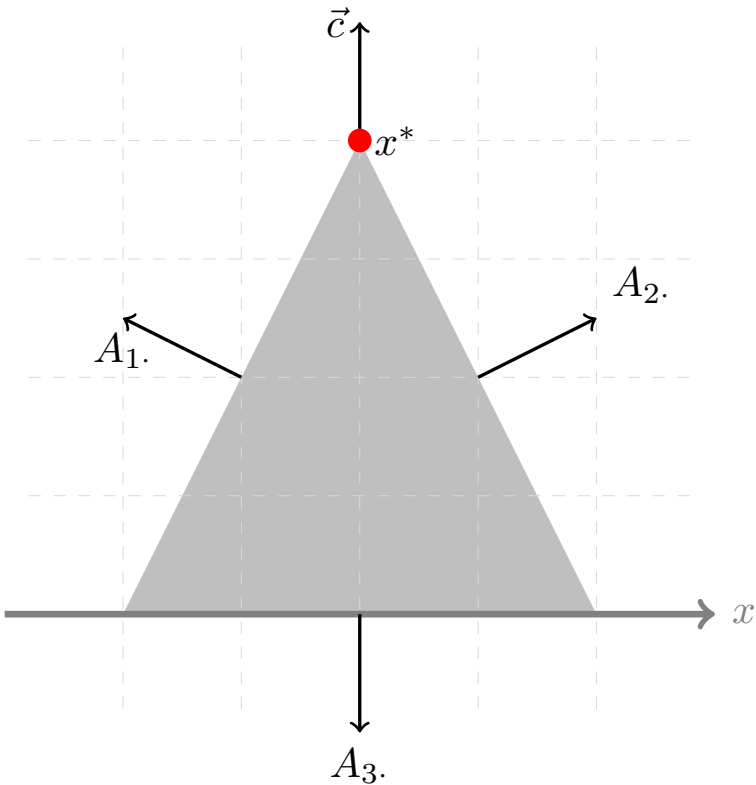


100% 1

100%



$$\begin{array}{llll}
\max & & y & \vec{c} = (0, 1) \\
s.t. & -x + \varepsilon y \leq 1 & A_1. = & (-1, \varepsilon) \\
& x + \varepsilon y \leq 1 & A_2. = & (1, \varepsilon) \\
& -y \leq 0 & A_3. = & (0, -1)
\end{array}$$



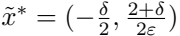






1001







11x\*

—

x\*

111

=

101  
2

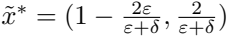
+

101  
e





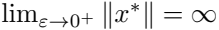
















$$\sin(2\pi \frac{i}{10^6})x + \cos(2\pi \frac{i}{10^6})v \leq 1, v \in \{1, \dots, 10^6\},$$





