

1.  $\int_{-\infty}^{\Delta} g(x) dx = \frac{3}{4} \dots \Leftarrow z$  definice horního kvantilu

$$\int_{-\infty}^{\Delta} \frac{a}{\pi(a^2+x^2)} dx = \frac{a}{\pi a^2} \int_{-\infty}^{\Delta} \frac{1}{1+(\frac{x}{a})^2} dx = \left| \begin{array}{l} y = \frac{x}{a} \\ dy = \frac{1}{a} dx \end{array} \right| =$$

$$= \frac{1}{\pi} \int_{-\infty}^{\Delta/a} \frac{1}{1+y^2} dy = \frac{1}{\pi} [\arctan y]_{-\infty}^{\Delta/a} =$$

$$= \frac{1}{\pi} \cdot \arctan \frac{\Delta}{a} + \frac{1}{\pi} \frac{\pi}{2} = \frac{3}{4}$$

$$\arctan \frac{\Delta}{a} = \frac{\pi}{4}$$

$$\frac{\Delta}{a} = 1$$

$$\Leftarrow \lg \frac{\pi}{4} = 1$$

shodou  
škála

$$\underline{\Delta = a}$$

2.

Obsah pod gratem:  $7 \cdot 6 + \frac{1}{2} \cdot 6 = 45$  obdelm'ku

$$\frac{1}{3} \cdot 45 \text{ obdelm'ku} = 15$$

$$15 = 3 + 6 + 6$$

$\Downarrow$

$$\underline{\Delta = 3/8}$$

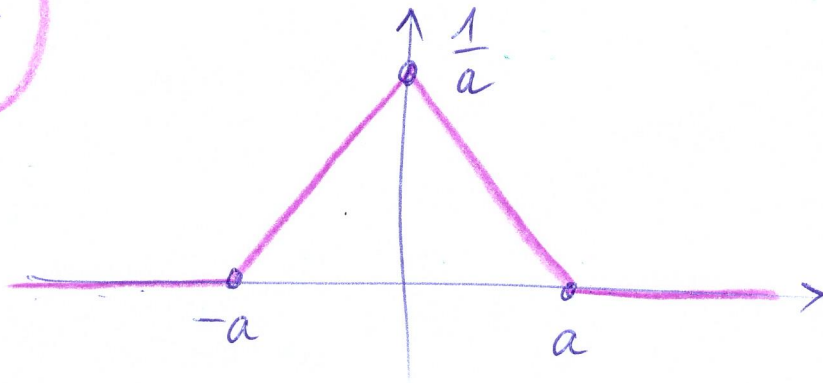
3.

Jenom D je distribuční funkce

$$P[X \in \langle 2, 5 \rangle] = P[X < 5] - P[X < 2] =$$

$$= F(5) - F(2) = \frac{1}{2} - \frac{1}{8} = \underline{\underline{\frac{3}{8}}}$$

5.



$$a^2 - x^2 < 0$$

$$|x| > a$$

$$\Downarrow$$

$$f(x) = 0$$

$$\text{amb}_L(x) = -a \quad \text{amb}_P(x) = a$$

$$\text{marg}(x) = 2a$$

4.

$$E(x) = \int_{-a}^a x \cdot \left(1 - \left|\frac{x}{a}\right|\right) dx = 0$$

← jasne' ze symetrie

$$E(x^2) \stackrel{!}{=} D(x) = \int_{-a}^a x^2 \left(1 - \left|\frac{x}{a}\right|\right) dx = \int_{-a}^a x^2 \left(1 + \frac{x}{a}\right) dx +$$

$$+ \int_0^a x^2 \left(1 - \frac{x}{a}\right) dx = \dots = \frac{a^2}{6} \stackrel{!}{=} \frac{24}{2}$$

$$a^2 = \frac{24 \cdot 6}{2} = 81$$

$$a = 9$$