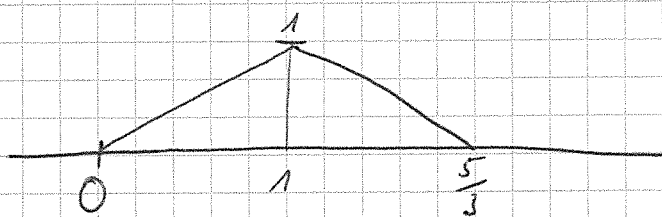
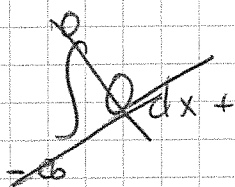


$$f_x(x) = \begin{cases} 2x - x^2 & \text{für } 0 \leq x \leq 1 \\ ax + b & \text{für } 1 < x \leq \frac{5}{3} \\ 0 & \text{sonst} \end{cases}$$

$$\lim_{x \rightarrow 1} 2x - x^2 = \lim_{x \rightarrow 1} ax + b$$

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

$$1 = a + b \Rightarrow \underline{b = 1 - a}$$



$$\int_0^1 (2x - x^2) dx = \left[x^2 - \frac{1}{3}x^3 \right]_0^1 = \frac{2}{3}$$

$$1 - \frac{2}{3} = \frac{1}{3} = \int_1^{\frac{5}{3}} (ax + b) dx = \left[\frac{1}{2}ax^2 + bx \right]_1^{\frac{5}{3}} = \frac{1}{2}a \left(\frac{25}{9} - 1 \right) + \left(\frac{5}{3} - 1 \right) b$$

$$= \frac{8}{9}a + \frac{2}{3}b$$

$$\underline{3 = 8a + 6b}$$

$$\boxed{a = 1 - b}$$

$$3 = 8(1 - b) + 6b = \del{8 - 2b}$$

$$3 = 8 - 8b + 6b$$

$$2b = 5$$

$$\underline{\underline{b = \frac{5}{2}}}$$

$$a = 1 - b = 1 - \frac{5}{2} = -\frac{3}{2}$$

$$\underline{\underline{a = -\frac{3}{2}}}$$

Probe

Stetigkeit Sei $x = \frac{5}{3}$

$$a \cdot \frac{5}{3} + b = 0$$

$$-\frac{3}{2} \left(\frac{5}{3} \right) + \frac{5}{2} = 0$$

$$0 = 0 \quad \checkmark$$