S 98 Nr. 12

$$s_0(3) = \int_0^3 (9{,}81 \cdot t)\,dt = \left[9{,}81 \cdot \frac{t^2}{2} \right]_0^3 = 9{,}81 \cdot \frac{3^2}{2} = 44{,}145\,m$$

In den ersten 3 Sekunden fällt der Körper 44,145 m.

S 98 Nr. 13

z.B. $F(x) = x$; $F(x) = x^3$; $F(x) = -5x^7$; $F(x) = a \cdot x^{111}$

S 98 Nr. 14

Voraussetzung $z > 0$

a) $$\int_0^z x\,dx = \left[\frac{x^2}{2} \right]_0^z = \frac{z^2}{2} - \frac{0^2}{2} = \frac{z^2}{2} = 18 \Rightarrow z^2 = 36 \Rightarrow \underline{z = 6}$$

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b) $$\int_1^z 4x\,dx = \left[4 \cdot \frac{x^2}{2} \right]_1^z = \left[2x^2 \right]_1^z = 2z^2 - 2 \cdot 1^2 = 2z^2 - 2 = 30$$

$\Rightarrow 2z^2 = 32 \Rightarrow z^2 = 16 \Rightarrow z_{1,2} = (\pm) 4$ da $z > 0 \Rightarrow \underline{z = 4}$

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c) $$\int_z^{10} 2x\,dx = \left[2 \cdot \frac{x^2}{2} \right]_z^{10} = \left[x^2 \right]_z^{10} = 10^2 - z^2 = 19$$

$\Rightarrow z^2 = 100 - 19 \Rightarrow z^2 = 81 \Rightarrow \underline{z = 9}$ mit $z > 0$

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d) $$\int_0^{2z} 0{,}4\,dx = \left[0{,}4 \cdot x \right]_0^{2z} = 0{,}4 \cdot 2z - 0{,}4 \cdot 0 = 0{,}8z = 8 \quad | : 0{,}8$$

$$\Rightarrow z = \frac{8}{0{,}8} = \frac{80}{8} = 10$$