

## Lösungen zu Extremwertaufgaben VI

1. (a)  $P(R) = RI^2 = U^2 \cdot \frac{R}{(R + R_i)^2}$

$$P'(R) = U^2 \cdot \frac{R_i - R}{(R + R_i)^3} = 0 \implies R = R_i$$

$$P''(R) = U^2 \cdot \frac{2R - 4R_i}{(R + R_i)^4} \implies P''(R_i) < 0 \implies \text{Maximum}$$

$$P_{\max} = P(R_i) = \frac{U^2}{4R_i}$$

2. (a)  $V = \frac{13}{16}x^2y$ ,  $y = \frac{16V}{13x^2}$ ,  $s = \frac{5}{8}x$

(b)  $A'(x) = \frac{13}{4}x - \frac{40V}{13x^2}$

$$A'(x) = 0 \implies x = \sqrt[3]{\frac{160V}{169}}, \quad k = \frac{y}{x} = \frac{13}{10}$$

(c)  $x = 8 \text{ m}$ ,  $y = 10,4 \text{ m}$ ,  $h = 5 \text{ m}$  und  $g = 3 \text{ m}$

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