

$$f(t) = -0,5t^4 + 14t^3 - 137,25t^2 + 532t + 75$$

1.1. Bestätigen sie, dass bei  $t=8$  ein TP existiert

$$f'(t) = -2t^3 + 42t^2 - 274,5t + 532$$

$$f'(8) = -2 \cdot 8^3 + 42 \cdot 8^2 - 274,5 \cdot 8 + 532 = 0$$

$$f''(t) = -6t^2 + 84t - 274,5$$

$$f''(8) = -6 \cdot 8^2 + 84 \cdot 8 - 274,5 = 13,5 > 0$$

$$\left. \begin{array}{l} f' = 0 \\ f'' > 0 \end{array} \right\} \text{TP}$$

$$\frac{-2t^3 + 42t^2 - 274,5t + 532}{-(-2t^3 + 16t^2)} : (x-8) = -2t^2 + 26t - 66,5$$

$$\frac{0 + 26t^2 - 274,5t}{-(26t^2 - 208,0t)}$$

$$\frac{0 - 66,5t + 532}{-(-66,5t + 532)}$$

$$0 + 0$$

$$-2t^2 + 26t - 66,5 = 0 \quad | : -2$$

$$t^2 - 13t + 33,25 = 0 \quad | pq$$

$$t_{1,2} = 6,5 \pm \sqrt{6,5^2 - 33,25}$$

$$t_{1,2} = 6,5 \pm 3$$

$$t_1 = 3,5$$

$$t_2 = 9,5$$

$$f''(t) = -6t^2$$

$$1.1. f(t) = -0,5t^4 + 14t^3 - 137,25t^2 + 532t + 75$$

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$$f'(8) = -2 \cdot 8^3 + 42 \cdot 8^2 - 274,5 \cdot 8 + 532 = 0$$

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$$f''(8) = -6 \cdot 8^2 + 84 \cdot 8 - 274,5 = 13,5$$

$f'(t) = 0, f''(t) > 0$  also Tiefpunkt

$$1.2. \frac{-2t^3 + 42t^2 - 274,5t + 532}{-(-2t^3 + 16t^2)} : (t-8) = -2t^2 + 26t - 66,5$$

$$\frac{0 + 26t^2 - 274,5t}{-(26t^2 - 208,0t)}$$

$$\frac{0 - 66,5t + 532}{-(66,5t + 532)}$$

$$0 + 0$$

$$f(x) = a x^4 + b x^3 + c x^2 + d x + k$$

$$f(0) = -6$$

$$f'(x) = 4 a x^3 + 3 b x^2 + 2 c x + d$$

$$f'(0) = -5$$

$$f''(x) = 12 a x^2 + 6 b x + 2 c$$

$$f'(2) = -17$$

$$1. f(0) = -6, \text{ denn } a \cdot 0^4 + b \cdot 0^3 + c \cdot 0^2 + d \cdot 0 + k = -6$$

$$f'(1) = 4$$

$$2. f'(0) = -5, \text{ denn } 4 a \cdot 0^3 + 3 b \cdot 0^2 + 2 c \cdot 0 + d = -5$$

$$f''(-1) = -2$$

$$3. f'(-2) = -17, \text{ denn } 4 a \cdot (-2)^3 + 3 b \cdot (-2)^2 + 2 c \cdot (-2) - 5 = -17$$

$$4. f'(1) = 4, \text{ denn } 4 a \cdot 1^3 + 3 b \cdot 1^2 + 2 c \cdot 1 - 5 = 4$$

$$5. f''(-1) = -2, \text{ denn } 12 a \cdot (-1)^2 + 6 b \cdot (-1) + 2 c = -2$$

$$\text{III} - 32a + 12b - 4c - 5 = -17 \quad |+5$$

$$\text{IV} 4a + 3b + 2c - 5 = 4 \quad |+5$$

$$\text{V} 12a - 6b + 2c = -2$$

$$\text{III} - 32a + 12b - 4c = -12 \quad |:(-2)$$

$$\text{IV} 4a + 3b + 2c = 9$$

$$\text{VI} 12a - 6b + 2c = -2$$

$$\begin{array}{r|rrr|rr} 16 & -6 & 2 & 6 & | \cdot (-1) & \text{III} - 4a = -8 \quad |:(-4) \\ 4 & 3 & 2 & 9 & + & a = 2 \\ \hline 12 & -6 & 2 & -2 & \leftarrow & \text{II} - 12 \cdot 2 + 96 = 3 \quad |+24 \end{array}$$

$$\begin{array}{r|rrr|rr} -16 & 6 & -2 & -6 & | & 96 = 27 \quad |:9 \\ 4 & 3 & 2 & 9 & + & b = 3 \\ \hline -4 & 0 & 0 & -8 & & \end{array}$$

$$\begin{array}{r|rrr|rr} & & & & & \text{I} - 16 \cdot 2 + 6 \cdot 3 - 2c = -6 \quad |+14 \\ -16 & 6 & -2 & -6 & & -2c = 8 \quad |:(-2) \\ -12 & 9 & 0 & 3 & & c = -4 \\ -4 & 0 & 0 & -8 & & \end{array}$$