

Mathe HÜ am 30.10.22

Bsp's) 1.168a-d), 1.169c), 1.170g, 1.171a), 1.173a)

1.168a)  $\langle b_n \rangle = \langle 8, 4, 2, \dots \rangle$   $q = \frac{b_2}{b_1} = \left(\frac{4}{8}\right) = \underline{\underline{\frac{1}{2}}}$   $b_1 = 8$

$s = \lim_{n \rightarrow \infty} \left( b_1 \cdot \frac{1 - q^n}{1 - q} \right) \rightarrow 0$

$(q < 1 \text{ d.h. } \checkmark)$

$s = \lim_{n \rightarrow \infty} 8 \cdot \left( \frac{1 - \frac{1}{2^n}}{1 - \frac{1}{2}} \right) = \underline{\underline{16}}$

b)  $\langle b_n \rangle = \langle \frac{9}{4}, \frac{45}{28}, \frac{225}{196}, \dots \rangle$

$q = \frac{\frac{45}{28}}{\frac{9}{4}} = \frac{5}{7}$

$s = \lim_{n \rightarrow \infty} \left( \frac{9}{4} \cdot \frac{1 - \left(\frac{5}{7}\right)^n}{1 - \frac{5}{7}} \right) = \underline{\underline{\frac{63}{8}}}$

c)  $\langle b_n \rangle = \langle 1,5; 1,165; 1,815, \dots \rangle$

$q = \frac{1,165}{1,5} = 1,1$

$q \geq 1 \rightarrow$  keine unendliche Summe möglich

$s = \infty$

d)  $\langle b_n \rangle = \langle 0,9; -0,8; 0,71; \dots \rangle$

$q = \frac{-0,8}{0,9} = -0,8889$

$s = \lim_{n \rightarrow \infty} \left( 0,9 \cdot \frac{1 + 0,8889^n}{1 + 0,8889} \right) = \underline{\underline{0,47644}}$

1.169c)  $s = \left( 3 + \frac{153846}{10^6} \right) + \left( 3 + \frac{153846}{10^{12}} \right) + \left( 3 + \frac{153846}{10^{18}} \right) + \dots$

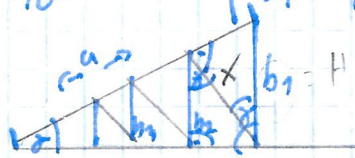
$q = 10^6$

da  $q \geq 1 \rightarrow s = 3 + \frac{153846}{10^6} \cdot \left( \frac{1 + 10^6}{1 - 10^6} \right) = \underline{\underline{3,18538}}$

1.171a)  $\begin{pmatrix} G \\ H \end{pmatrix} \begin{pmatrix} A \\ H \end{pmatrix} \begin{pmatrix} G \\ A \end{pmatrix}$

$a = 1m = 100cm$

$\alpha = 60^\circ$



$\sin(60^\circ) = \frac{b_1}{100} \cdot 100$

$b_1 = \sin(60^\circ) \cdot 100$

$b_1 = 86,60cm$

$\cos(\alpha) = \frac{b_2}{x} \cdot x$

$\cos(60^\circ) = \frac{x}{b_1} \cdot b_1 = x$

$x = 43,3cm$

$b_2 = \cos(60^\circ) \cdot \cos(60^\circ) \cdot 86,60cm = \underline{\underline{21,65cm}}$



Steven Vlagic

11te Mathe HÄ am 30.10.22

1.11a) weiter

$$b_1 = 86,60 \text{ cm}$$

$$b_2 = 21,65 \text{ cm}$$

$$q = \frac{21,65 \text{ cm}}{86,60 \text{ cm}} = \underline{\underline{0,249}}$$

$q < 1$  d.h. s. möglich

$$b_3 = 86,60 \cdot (0,249)^2 = \underline{\underline{5,156 \text{ cm}}} \quad 1) \angle b_n = \langle 86,60; 21,65; 5,15; 1,256; \dots \rangle$$

$$b_4 = 86,60 \cdot 0,249^3 = \underline{\underline{1,25801 \text{ cm}}}$$

$$2) s = \sum_{k=1}^{\infty} \left( \frac{86,60}{1-0,249} \right) = \underline{\underline{115,31 \text{ cm}}}$$

1.113a)

$$r_1 = 50 \text{ cm}$$

$$r_2 = 0,5 \cdot 50 \text{ cm} = \underline{\underline{25 \text{ cm}}}$$

$$n = 12$$

$$1) q = \frac{25}{50} = \underline{\underline{\frac{1}{2}}} \quad s_{12} = 50 \cdot \left( \frac{1 - \left(\frac{1}{2}\right)^{12}}{1 - \frac{1}{2}} \right) = \underline{\underline{99,975 \text{ cm}}}$$

$$U_{\frac{k}{2}} = \frac{2 \cdot 50 \cdot r}{2} = \frac{2 \cdot 50 \cdot 99,975}{2} = \underline{\underline{314,0807 \text{ cm}}}$$

$$2) \text{ Summe } \left( \frac{50}{1 - \frac{1}{2}} \right) = 100$$

$$U_{\frac{k}{2}} = \frac{2 \cdot 50 \cdot r}{2} = \frac{2 \cdot 50 \cdot 100}{2} = \underline{\underline{314,159}}$$

1.110)

$$S = 25$$

$$S_2 = \frac{625}{9}$$

$$S_1 = b_1 + b_2 + b_3 + \dots$$

$$S_2 = b_1^2 + b_2^2 + b_3^2 + \dots$$

$$25 = \frac{b_1}{1-q}$$

$$b_1 = 25 - 25q$$

$$\frac{625}{9} = \frac{b_1^2}{1-q}$$

$$625 - 625q = (25 - 25q)^2$$

$$\frac{625}{9} - \frac{625}{9}q = 625 - 1250q + 625q^2$$

$$625q^2 - 1180,56q + \frac{5000}{9} = 0$$

$$q_1 = \frac{8}{9} = \underline{\underline{0,8}}$$

$$q_2 = 1 \quad \text{fällt weg}$$

$$\underline{\underline{q < 1}}$$

$$b_1 = 25 - 25 \cdot 0,8$$

$$\underline{\underline{b_1 = 5}}$$