MAA9

1. a) $\frac{\pi \mid 180^\circ}{8 \mid x} \rightarrow x = \frac{8 \cdot 180^\circ}{\pi} \approx 458{,}4^\circ$

b) $\sin x = \frac{1}{2} \rightarrow x = \frac{\pi}{6} + n2\pi$ tai $x = \pi - \frac{\pi}{6} + n2\pi = \frac{5\pi}{6} + n2\pi$

c) $\sqrt{3}\sin x = \cos x \rightarrow \tan x = \frac{1}{\sqrt{3}} \rightarrow x = \frac{\pi}{3} + n\pi$

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2. a) $f'(x) = \cos x - 2\sin 2x + \frac{3}{\tan^2 3x} + 4$

b) $g'(x) = \cos(\cos x) \cdot (-\sin x)$

c) $h'(x) = \frac{\tan^2 x - (x-1)\left(2\tan^2 x \cdot \left(\frac{1}{\cos^2 x}\right)\right)}{\tan^4 x}$

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3. $a_n = 7n - 1$ $\quad d = a_{n+1} - a_n = 7(n+1) - 1 - (7n - 1) = 7$ vakio

$a_3 = 7 \cdot 3 - 1 = 20$

$a_{19} = 7 \cdot 19 - 1 = 132$

$S_{17} = 17 \cdot \frac{20 + 132}{2} = 1292$

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5. 1. viikko = $3a_1$
2. viikko = $3a_1 + 600$
3. viikko = $3a_1 + 1200$ } $+600 = d$ aritm. jono

⋮

26. viikko = $3a_1 + (26-1)\cdot 600 = 3a_1 + 15000$

$$S_{26} = 26 \cdot \frac{3a_1 + 3a_1 + 15000}{2} = 390000 \quad \rightarrow 6a_1 = 15000 \cdot \frac{1}{6}$$

$a_1 = \underline{2500}$ (m)

$a_{26} = 2500 + (26-1)\cdot 200 = \underline{7500}$

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6. a) $x_n = ab^n$, $y_n = cd^n \rightarrow x_n y_n = ac\,(bd)^n = ef^n$ O.

b) Kaava edellistä kerrottuna: $a_n = a_{n-1} \cdot a_{n-2}$, $\begin{cases} a_1 = 1 \\ a_2 = 2 \end{cases}$

$a_7 = 8 \cdot 32 = 256$
$a_8 = 32 \cdot 256 = 8192$
$a_9 = 256 \cdot 8192 = 2097152$
$a_{10} = 2097152 \cdot 8192 \approx 1{,}72 \cdot 10^{10}$

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7. $f'(x) = -\sqrt{3} \cdot \sin x - 2 \sin x \cos x = 0$

$\sin x\,(-\sqrt{3} - 2\cos x) = 0$

$x = 0$ tai π (väliltä $0 \ldots 2\pi$)

$\cos x = -\frac{\sqrt{3}}{2}$

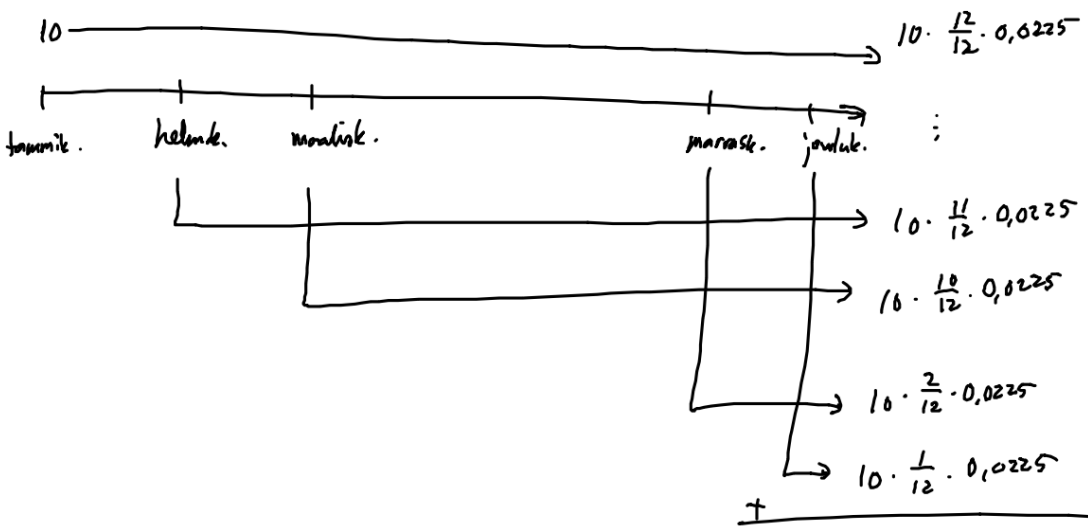
$x = \pm\frac{7}{6}\pi + n2\pi$

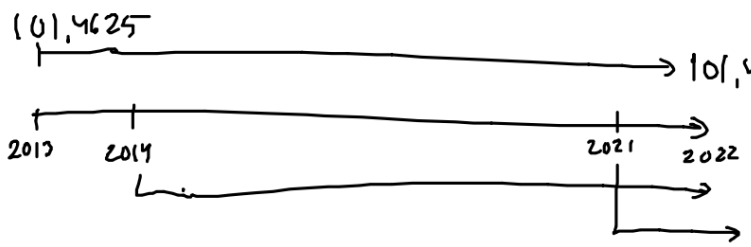
$\rightarrow \frac{7}{6}\pi$ tai $\frac{5\pi}{6}$

jakso $[0, 2\pi]$

$f(0) = \sqrt{3}$
$f(2\pi) = \sqrt{3}$
$f(\frac{7}{6}\pi) = -1\frac{3}{4}$
$f(\frac{5\pi}{6}) = -1\frac{3}{4}$

8.





Geom. summa $S_9 = 103{,}75 \dfrac{(1-1{,}0225^9)}{(1-1{,}0225)} \approx 1022$