


1 a) $2019 = 33 \cdot 60 + 39$



b) $\frac{1}{2019} = \frac{X}{60} + \frac{Y}{60^2} + \frac{Z}{60^3} + \dots$

$X = 0$ / $Y = 1$ / $Z = 46$

2 a) Pappus

b) Siffrorna
Nollan
Positionsidén

c) T.ex.
Nio kapitel
om räkne-
konsten
eller
Sulvasutra

3 a) $\frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64}$

b) $\frac{1}{3} + \frac{1}{11} + \frac{1}{33}$

c) $\frac{1}{3} + \frac{1}{9} + \frac{1}{99}$

5/

$$X = \sqrt{388129}$$

$$600 < X < 700$$

$$X = a \cdot 10^2 + b \cdot 10^1 + C \quad \text{välj } a=6$$

Kvadrera och välj rätt b och

$$C, \quad X = 623$$

4/

T.ex. K_4

*	*	*	*
*	*	*	□
x	*	□	□
*	□	□	□

* T_n - diagonalen + T_{n-1}

□ T_{n-1} - det under diagonalen

6/

$$r=1, D=2, A = \pi \cdot 1^2 = \pi$$

$$A_k = \left(\frac{13 \cdot 2}{15}\right)^2 = \frac{169 \cdot 4}{225} = \frac{676}{225} = 3 \frac{1}{225}$$

$$\approx 3.004$$

7/

$$X_1 \equiv 1 \pmod{7}$$

$$X_1 = 85$$

$$X_1 \equiv 0 \pmod{17}$$

$$X_2 \equiv 0 \pmod{7}$$

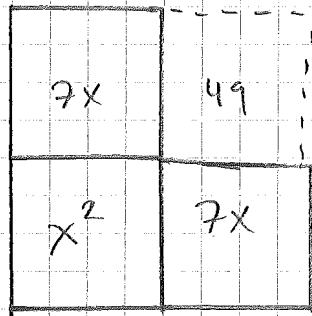
$$X_2 = 35$$

$$X_2 \equiv 1 \pmod{17}$$

$$X = 2 \cdot 85 + 4 \cdot 35 - 2 \cdot 7 \cdot 17 = 72$$

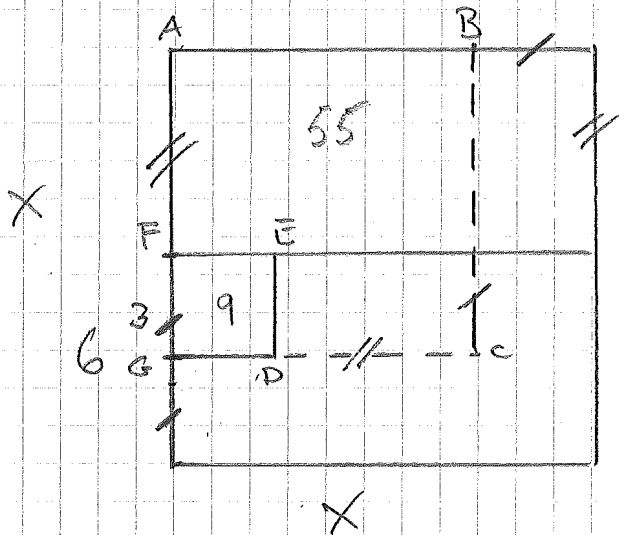
$$72 = 7 \cdot 10 + 2 = 4 + 4 \cdot 17 \quad \text{ok!}$$

8a)



Gnomonen har
 arean 147
 $147 + 49 = 196 = 14^2$
 $x + 7 = 14$
 $x = 7$

b)



Gnomonen
 ABCDEF har
 arean 55
 Kvadraten ABCG
 har arean
 $55 + 9 = 64 = 8^2$
 $x = 8 + 3 = 11$

9) a) $\frac{7}{19} = [0; 2, 1, 2, 2]$ eftersom

$$\frac{19}{7} = 2 + \frac{5}{7}, \quad \frac{7}{5} = 1 + \frac{2}{5}, \quad \frac{5}{2} = 2 + \frac{1}{2}$$

b) $\pi \approx 3 + \frac{1}{7 + \frac{1}{15 + \frac{1}{1}}}$

$$= \frac{355}{113}$$

$$\frac{1}{292}$$

försummas