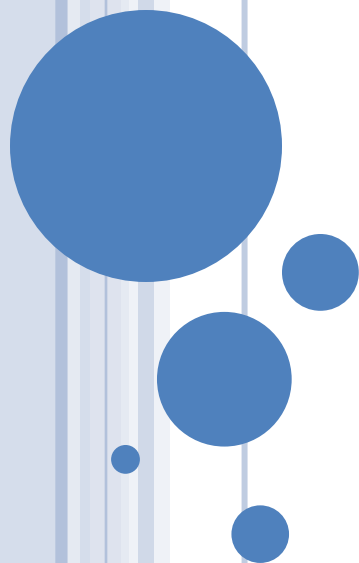


36 sovelluksia geometrisesta summasta

teht 215, 217 218, 219



Teht 219

$$a_1 = 150$$

$$q = 0,88$$

$$S_n = 400$$

$$\frac{150(1 - 0,88^n)}{1 - 0,88} = 400 \quad | \cdot 0,12$$

$$150(1 - 0,88^n) = 48 \quad | :150$$

$$1 - 0,88^n = \frac{8}{25}$$

$$-0,88^n = -\frac{17}{25} \quad | \cdot (-1)$$

$$0,88^n = \frac{17}{25} \quad | \lg$$

$$n \lg 0,88 = \lg \frac{17}{25} \quad | : \lg 0,88$$

$$n = \frac{\lg \frac{17}{25}}{\lg 0,88} = 3,016...$$

Jos $n = 3$, niin

$$S_3 = \frac{150(1 - 0,88^3)}{1 - 0,88} = 398,16 < 400$$

Jos $n = 4$, niin

$$S_4 = \frac{150(1 - 0,88^4)}{1 - 0,88} = 500,3808 > 400$$

Vastaus: 4 päivän jälkeen



Teht 217_218

217. $a_1 = 94$ $q = 1,063$

$$S_{12} = \frac{94(1 - 1,063^{12})}{1 - 1,063} = 1613,829... \approx 1614$$

218. $a_1 = 8,0$ (mm) $q = 1,047$

Viikon eli 7 päivän aikana satoi:

$$S_7 = \frac{8,0(1 - 1,047^7)}{1 - 1,047} = 64,544... \approx 65 \text{ (mm)}$$

Teht 215

$$a_1 = 1\text{€}$$

$$a_2 = 1 \cdot 2\text{€}$$

$$a_3 = 1 \cdot 2 \cdot 2\text{€} = 1 \cdot 2^2\text{€}$$

$$a_4 = 1 \cdot 2 \cdot 2 \cdot 2\text{€} = 1 \cdot 2^3\text{€}$$

$$\vdots$$

$$a_n = 1 \cdot 2^{n-1} \quad q = 2$$

a) $n = 7$

$$S_7 = \frac{a_1(1 - q^7)}{1 - q} = \frac{1(1 - 2^7)}{1 - 2} = 127 \text{ (€)}$$

b) $n = 14$

$$S_{14} = \frac{1(1 - 2^{14})}{1 - 2} = 16383 \text{ (€)}$$