

## Teema 4

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### Kodune töö

$$\begin{array}{l} \textcircled{1} \quad a_1 = 24 \\ \quad \quad d = 2 \\ \hline \quad \quad a_n = 56 \\ \quad \quad n? \quad S_n \end{array} \quad \begin{array}{l} 1) \quad n? \quad a_n = a_1 + (n-1) \cdot d \\ \quad \quad 24 + 2(n-1) = 56 \\ \quad \quad 24 + 2n - 2 = 56 \\ \quad \quad 2n = 34 \quad | :2 \\ \hline \quad \quad n = 17 \end{array}$$

$$2) \quad S_{17} ? \quad S_n = \frac{a_1 + a_n}{2} \cdot n$$

$$S_{17} = \frac{24 + 56}{2} \cdot 17 = \underline{680}$$

V. Saablis on 17 rida tooli. Tooli on kokku 680

$$\begin{array}{l} \textcircled{2} a) \quad a_1 = 150 \text{ €} \\ \quad \quad a_{11} = 900 \text{ €} \\ \hline \quad \quad a_{31} ? \end{array} \quad \begin{array}{l} 1) \quad d? \quad a_{11} = a_1 + 10d \\ \quad \quad 150 + 10d = 900 \\ \quad \quad 10d = 750 \quad | :10 \\ \quad \quad d = 75 \end{array}$$

$$2) \quad a_{31} ? \quad a_{31} = a_1 + 30d; \quad a_{31} = 150 + 30 \cdot 75 = \underline{2400 \text{ €}}$$

V. Maal osteti 2400 euroga

$$\begin{array}{l} b) \quad a = 10000 \text{ €} \\ \quad \quad p = 20\% \\ \hline \quad \quad n = 4 \\ \quad \quad A \end{array} \quad \begin{array}{l} A = a \left( 1 + \frac{p}{100} \right)^n \\ A = 10000 \cdot 1,2^4 = \underline{20736 \text{ €}} \end{array}$$

V. antikese maksaab nelje aastat pärast 20736 eurot.

$$\begin{array}{l} \textcircled{3} a) \quad a_1 = 2500 \text{ kg} \\ \quad \quad q = 0,8 \\ \hline \quad \quad S_4 \end{array} \quad \begin{array}{l} S_n = \frac{a_1(q^n - 1)}{q - 1} \\ S_4 = \frac{2500 \cdot (0,8^4 - 1)}{0,8 - 1} = \underline{7380 \text{ kg}} \end{array}$$

V. nelje nädalalaga osteti 7380 kg majju

$$6) \begin{array}{l} S_8 = 7240 \text{ kg} \\ a_1 = 730 \text{ kg} \\ \hline d? \end{array}$$

$$d.? \quad S_n = \frac{[2a_1 + (n-1) \cdot d] \cdot n}{2}$$

$$\frac{(2 \cdot 730 + 7d) \cdot 8}{2} = 7240$$

$$4(1460 + 7d) = 7240$$

$$5840 + 28d = 7240$$

$$28d = 1400 \quad | :28$$

$$d = 50$$

V: Maajade m\u00fctik suurenes igal n\u00e4dalal 50 kg v\u00f5ra.

$$4) a) \begin{array}{l} a_1 + a_2 = 672,5 \text{€} \\ \hline a_{15} = 370 \text{€} \\ a_{24} ? \end{array}$$

$$1) a_1? d?$$

$$\begin{cases} a_1 + a_2 = 672,5 \\ a_{15} = 370 \end{cases} \quad \begin{cases} a_1 + a_1 + d = 672,5 \\ a_1 + 14d = 370 \end{cases}$$

$$\begin{cases} 2a_1 + d = 672,5 \\ a_1 + 14d = 370 \end{cases}$$

$$D = \begin{vmatrix} 2 & 1 \\ 1 & 14 \end{vmatrix} = 28 - 1 = 27$$

$$D_{a_1} = \begin{vmatrix} 672,5 & 1 \\ 370 & 14 \end{vmatrix} = 9415 - 370 = 9045$$

$$D_d = \begin{vmatrix} 2 & 672,5 \\ 1 & 370 \end{vmatrix} = 740 - 672,5 = 67,5$$

$$a_1 = \frac{9045}{27} = 335$$

$$d = \frac{67,5}{27} = 2,5$$

$$\begin{cases} a_1 = 335 \text{€} \\ d = 2,5 \text{€} \end{cases}$$

$$2) a_{24} ? \quad a_{24} = a_1 + 23d; \quad a_{24} = 335 + 23 \cdot 2,5 = \underline{392,5 \text{€}}$$

V: perch kulus toidu ostmiseks 2014. a detsembris 392,5 eurot

b) Mitu eurot kulus keskmiselt \u00e4hes kuus toidule?

$$* S_{24} ? \quad S_{24} = \frac{a_1 + a_{24}}{2} \cdot 24; \quad S_{24} = \frac{335 + 392,5}{2} \cdot 24 = 8730 \text{€}$$

$$* \text{ keskmiselt kuus: } 8730 : 24 = \underline{363,75 \text{€}}$$

V: \u00e4hes kuus kulus keskmiselt 363,75 eurot

c) Mitme % võrra oli 2014. a detsembri kuu kulu 3  
 suuren 2013. a jaanuarikunst?

\* suuren eurodes:  $392,5 - 335 = 57,5 \text{ €}$

\* suuren %-des:  $100\% - 335$   
 $\times \% = 57,5$

$$x = \frac{100 - 57,5}{335} \approx \underline{17,2\%}$$

V: 8,6 % oli toidukulu suuren.

5)  $a = 5000 \text{ €}$       1)  $A_1?$      $A = a \left(1 + \frac{p}{100}\right)^n$

$p_1 = 0,6\%$

$A_1 = 5000 \cdot 1,006^2 = 5060,18 \text{ €}$

$p_2 = 6\%$

2)  $A_2?$      $A_2 = 5000 \cdot 1,06^2 = 5618 \text{ €}$

$n = 2$

$A_1? A_2$

3) Rohkem teenitud eurod:

$5618 - 5060,18 \approx \underline{557,82 \text{ €}}$

V: Mart oleks rohkem teenitud 557,82 eurot

6) a)  $S_n = 9700$       1)  $a_1?$      $\begin{cases} a_1 + a_2 + a_3 + a_4 = 9700 \\ d? \end{cases}$

$a_3 + a_4 = 1400 + a_1 + a_2$        $\begin{cases} a_3 + a_4 - a_1 - a_2 = 1400 \end{cases}$

$a_3$

$$\begin{cases} a_1 + a_1 + d + a_1 + 2d + a_1 + 3d = 9700 \\ a_1 + 2d + a_1 + 3d - a_1 - a_1 - d = 1400 \end{cases} \quad \begin{cases} 4a_1 + 6d = 9700 \\ 4d = 1400 \quad | :4 \Rightarrow d = 350 \end{cases}$$

$a_1?$      $4a_1 + 6 \cdot 350 = 9700$

$4a_1 = 7600 \quad | :4$        $\begin{cases} a_1 = 1900 \\ d = 350 \end{cases}$   
 $a_1 = 1900$

2)  $a_3?$      $a_3 = a_1 + 2d$ ;     $a_3 = 1900 + 2 \cdot 350 = \underline{2600}$  toodet.

V: Kolmandel aastal valmistati 2565 toodet

b)  $S_n = 16650$

$S_n = \frac{[2a_1 + (n-1) \cdot d] \cdot n}{2}$

$d?$

$\frac{[2 \cdot 1900 + 350(n-1)] \cdot n}{2} = 16650 \quad | \cdot 2$

$(3800 + 350n - 350)n = 33300$

$350n^2 + 3450n - 33300 = 0 \quad | :50$

$7n^2 + 69n - 666 = 0$

$$n_{1,2} = \frac{-69 \pm \sqrt{4761 + 4 \cdot 7 \cdot 666}}{2 \cdot 7} = \frac{-69 \pm \sqrt{23409}}{14} = \frac{-69 \pm 153}{14}$$

$$n_1 = \frac{-69 - 153}{14} = -\frac{222}{14} \text{ (ciroba ketsligz)}$$

$$n_2 = \frac{-69 + 153}{14} = \underline{6}$$

V: 16 650 took valmista misch kulur 6 avstat.

(7) a)  $d = 25$       1)  $a_1?$      $a_2 = a_1 + 6d$

$$\underline{a_7 = 195}$$

$$a_1 + 6 \cdot 25 = 195$$

$$S_7?$$

$$a_1 = 45$$

2)  $S_7?$      $S_n = \frac{2a_1 + (n-1)d}{2} \cdot n$

$$S_7 = \frac{2 \cdot 45 + 6 \cdot 25}{2} \cdot 7 = \underline{840}$$

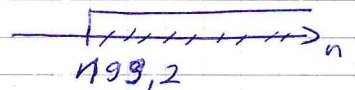
b)  $a_n \geq 5000$      $n?$      $a_n = a_1 + (n-1)d$

$$45 + 25(n-1) \geq 5000$$

$$45 + 25n - 25 \geq 5000$$

$$25n \geq 4980 \quad | :25$$

$$n \geq 199,2$$



$n \in [199,2; \infty) \Rightarrow$  200. lige uletat avur 5000.

(8) a)  $a_5 + a_6 = 5a_1$       1)  $a_1?$      $d?$

$$S_6 = 264$$

$$a_6?$$

$$\begin{cases} a_5 + a_6 = 5a_1 \\ S_6 = 264 \end{cases} \begin{cases} a_1 + 4d + a_1 + 5d = 5a_1 \\ a_1 + a_2 + a_3 + a_4 + a_5 + a_6 = 264 \end{cases}$$

$$\begin{cases} -3a_1 + 9d = 0 \quad | :(-3) \end{cases}$$

$$\begin{cases} a_1 + a_1 + d + a_1 + 2d + a_1 + 3d + a_1 + 4d + a_1 + 5d = 264 \\ a_1 - 3d = 0 \end{cases} \begin{cases} a_1 - 3d = 0 \\ 6a_1 + 15d = 264 \quad | :3 \end{cases}$$

$$\begin{cases} a_1 - 3d = 0 \Rightarrow a_1 = 3d \\ 2a_1 + 5d = 88 \end{cases}$$

$$d? \quad 2 \cdot 3d + 5d = 88$$

$$11d = 88 \quad | :11$$

$$d = 8$$

$$a_1? \quad a_1 = 3 \cdot 8 \quad \begin{cases} a_1 = 24 \\ d = 8 \end{cases}$$

2)  $a_6?$      $a_6 = a_1 + 5d$

$$a_6 = 24 + 5 \cdot 8 = \underline{64}$$

b) Väestökoonvalikome te keskmine vanus:

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$$S_n = n \Rightarrow 264 : 6 = \underline{44 \text{ a}}$$

V. Keskmine vanus on 44 aastat.