Rafael Čebulj s.p.
Smledniška cesta 126
SI-4000 Kranj
T: +386 (0)4 25 95 400
F: +386 (0)4 25 95 405
M: +386 (0)41 744 178

1. $a_n = 8 \cdot \left(\frac{1}{4}\right)^{\frac{n}{2}-2}$

$a_1 = 8 \cdot \left(\frac{1}{4}\right)^{\frac{1}{2}-2}$
$a_1 = 8 \cdot \left(\frac{1}{4}\right)^{-\frac{3}{2}}$
$a_1 = 8 \cdot \sqrt{4^3}$
$a_1 = 8 \cdot 8$
$a_1 = 64$

$a_2 = 8 \cdot \left(\frac{1}{4}\right)^{1-2}$
$a_2 = 8 \cdot \left(\frac{1}{4}\right)^{-1}$
$a_2 = 8 \cdot 4$
$a_2 = 32$

$a_4 = 8 \cdot \left(\frac{1}{4}\right)^{2-2}$
$a_4 = 8 \cdot \left(\frac{1}{4}\right)^{0}$
$a_4 = 8 \cdot 1$
$a_4 = 8$

$a_{100} = 8 \cdot \left(\frac{1}{4}\right)^{50-2}$
$a_{100} = 8 \cdot \left(\frac{1}{4}\right)^{48}$
$a_{100} = 2^3 \cdot 2^{-2 \cdot 48}$
$a_{100} = 2^{-93}$

$8 \cdot \left(\frac{1}{4}\right)^{\frac{n}{2}-2} = 2^{-27}$
$2^3 \cdot 2^{-2 \cdot (\frac{n}{2}-2)} = 2^{-27}$
$2^3 \cdot 2^{-n+4} = 2^{-27}$
$3 - n + 4 = -27$
$n = 34$

2. $a_1 = \frac{1}{2}$
$a_2 = \frac{1}{4}$
$a_{n+2} = 2a_n + 8a_{n+1}$

$a_3 = 2 \cdot a_1 + 8 \cdot a_2 = 2 \cdot \frac{1}{2} + 8 \cdot \frac{1}{4} = 1 + 2 = 3$

$a_4 = 2 \cdot a_2 + 8 \cdot a_3 = 2 \cdot \frac{1}{4} + 8 \cdot 3 = \frac{1}{2} + 24 = 24\frac{1}{2}$

$a_5 = 2 \cdot a_3 + 8 \cdot a_4 = 2 \cdot 3 + 8 \cdot 24\frac{1}{2} = 6 + 196 = 202$

3. $a_1 + a_2 = 13$
$S_{20} = 670$

$a_1 + a_2 = 13$
$a_1 + a_1 + d = 13$
$2a_1 + d = 13$

$S_n = \frac{n}{2} \cdot (a_1 + a_n)$
$S_{20} = \frac{20}{2} \cdot (a_1 + a_{20})$
$670 = 10 \cdot (a_1 + a_1 + 19d)$
$670 = 20a_1 + 190d \quad /:10$
$67 = 2a_1 + 19d$

$2a_1 + d = 13 \quad /\cdot(-1)$
$2a_1 + 19d = 67$
$-2a_1 - d = -13$
$2a_1 + 19d = 67$
$18d = 54$
$d = 3$

$2a_1 + 3 = 13$
$2a_1 = 10$
$a_1 = 5$

$a_n = a_1 + (n-1) \cdot d$
$a_n = 5 + (n-1) \cdot 3$
$a_n = 5 + 3n - 3$
$a_n = 2 + 3n$

4. $1 \cdot 23 = 23$
$2 \cdot 23 = 46$
$3 \cdot 23 = 69$
$4 \cdot 23 = 92$
$5 \cdot 23 = 115$
$6 \cdot 23 = 138$
$\vdots$
$43 \cdot 23 = 989$

$a_1 = 115$
$d = 23$
$a_n = 989$
$n = 39$
$43 - 4$

$\frac{n}{2} \cdot (a_1 + a_n) = \frac{39}{2} \cdot (115 + 989) =$
$= 21528$

5. $a_1 = 15$
$d = -3$
$a_n = a_1 + (n-1)d$
$a_n = 15 + (n-1) \cdot (-3)$
$a_n = 15 - 3n + 3$
$a_n = 18 - 3n$

$S_n < -2000$
$\frac{n}{2} \cdot (a_1 + a_n) < -2000$
$\frac{n}{2} \cdot (15 + 18 - 3n) < -2000 \ / \cdot 2$
$n \cdot (33 - 3n) < -4000$
$33n - 3n^2 + 4000 < 0 \ / \cdot (-1)$
$3n^2 - 33n - 4000 > 0$

$D = b^2 - 4ac$
$D = 1089 + 48000$
$D = 49089$
$\sqrt{D} \doteq 211{,}56$

$n_1 = \frac{-b + \sqrt{D}}{2a} = \frac{33 + 211{,}56}{6} \doteq 42{,}43$ ✓
1. večje N število

$n_2 = \frac{-b - \sqrt{D}}{2a} = \frac{33 - 211{,}56}{6} \doteq -31{,}43$ //

Odg.: Sešteti moramo najmanj 43 členov.

6. $4x - 1, \ 2x - 4, \ x + 3$

a) $a = \frac{a + b}{2}$
$2x - 4 = \frac{4x - 1 + x + 3}{2} \ / \cdot 2$
$4x - 8 = 4x - 1 + x + 3$
$x = -10$

b) $a = \sqrt{a \cdot b}$
$(2x - 4) = \sqrt{(4x - 1) \cdot (x + 3)} \ /^2$
$4x^2 - 16x + 16 = 4x^2 + 12x - x - 3$
$-27x = -19$
$x = \frac{19}{27}$

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$2 = \sqrt{a \cdot b}$

$5^{-2x+1} = \sqrt{5^{-2x+2} \cdot 5^{3x-2}} \quad /^2$

$5^{-4x+2} = 5^{2x+2} \cdot 5^{3x-2}$

$-4x+2 = 2x+2+3x-2$

$-9x = -2$

$x = \frac{2}{9}$

8. $a_n = \frac{2n-1}{n}$

$a_1 = \frac{2 \cdot 1 - 1}{1} = \frac{2-1}{1} = 1$

$a_2 = \frac{2 \cdot 2 - 1}{2} = \frac{4-1}{2} = \frac{3}{2}$

$a_{n+1} - a_n > 0$

$\frac{2n+1}{n+1} - \frac{2n-1}{n} > 0$

$\frac{2n^2+n}{n(n+1)} - \frac{2n^2+n-1}{n(n+1)} > 0$

$\frac{1}{n(n+1)} > 0$

9. $a_1 = 4$

$a_5 = 324$

$a_5 = a_1 \cdot k^4$

$324 = 4 \cdot k^4$

$81 = k^4 \quad /\sqrt[4]{}$

$k_1 = 3 \longrightarrow 4, 12, 36, 108, 324$

$k_2 = -3 \longrightarrow 4, -12, 36, -108, 324$

10. $f(x) = 16x^3 - 42x^2 + 21x - 2$

$\frac{c}{d} = \pm 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, 2$

	16	-42	21	-2
2		32	-20	2
	16	-10	1	0

$x_1 = 2$

$16x^2 - 10x + 1 = 0$

$D = 100 - 64$

$D = 36$

$\sqrt{D} = 6$

$x_1 = \frac{10+6}{32} = \frac{1}{2}$

$x_2 = \frac{10-6}{32} = \frac{1}{8}$

$a_1 = 2$

$a_2 = \frac{1}{2}$

$a_3 = \frac{1}{8}$

$a_2 = a_1 \cdot k$

$\frac{1}{2} = 2 \cdot k \quad /:2$

$k = \frac{1}{4}$

$a_n = a_1 \cdot k^{n-1}$

$a_n = a_1 \cdot \left(\frac{1}{4}\right)^{n-1}$

11. $a_1 = 3$
$a_n = 41$
$S_n = 440$

$S_n = \frac{n}{2} \cdot (a_1 + a_n)$
$440 = \frac{n}{2} \cdot (3 + 41)$
$440 = \frac{n}{2} \cdot 44 \quad /:44$
$10 = \frac{n}{2} \quad /\cdot 2$
$n = 20$

$a_n = a_1 + (n-1) \cdot d$
$41 = 3 + (20-1) \cdot d$
$41 = 3 + 19d$
$38 = 19d$
$d = 2$

3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41

12.

13. $n = 4$

$a_1 + 1,\ a_2,\ a_3 + 2$ → GEO. ZAP.

$a_1 + 4$

$a_1 + 2 \cdot 4 + 2$

$=$

$a_1 + 10$

$(a_1 + 4)^{/2} = \sqrt{(a_1 + 1) \cdot (a_1 + 10)}\ /^2$

$a_1^2 + 8a_1 + 16 = a_1^2 + 11a_1 + 10$

$3a_1 = 6$

$a_1 = 2$

$a_1,\ a_2,\ a_3$ → ARI. ZAP.

2

$2 + 4$

$=$

6

$2 + 2 \cdot 4$

$=$

10

2, 6, 10