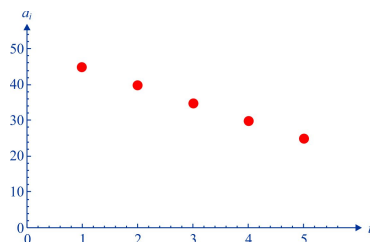


7 Sequências e progressões

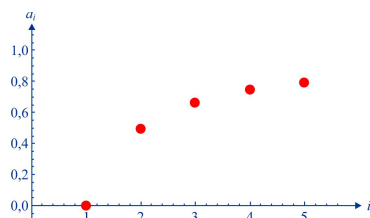
7.1 Sequências

1. a) 45, 40, 35, 30, 25
 b) 3, 6, 9, 12, 15
 c) 1, 8, 27, 64, 125
 d) 3, 9, 27, 81, 243
 e) $1/3, 1/9, 1/27, 1/81, 1/243$
 f) 0, 3, 8, 15, 24
 g) 1, 3, 7, 15, 21
 h) $1/2, 1/4, 1/8, 1/16, 1/32$
 i) $0, 1/2, 2/3, 3/4, 4/5$
 j) $-1/2, 2/3, -3/4, 4/5, -5/6$
 k) 1, -3, 9, -27, 81
 l) $\pi/2, 5\pi/2, 9\pi/2, 13\pi/2, 17\pi/2$
 m) 1, 3, 6, 10, 15
 n) $\sqrt{2}, 2, 2\sqrt{2}, 4, 4\sqrt{2}$
 o) 0, 4, 0, 4, 0
 p) $2^{2-b}, 2^{2-2b}, 2^{2-3b}, 2^{2-4b}, 2^{2-5b}$

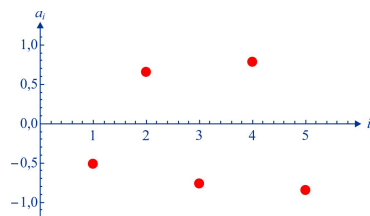
2. a)



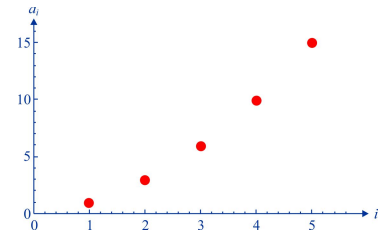
b)



c)



d)



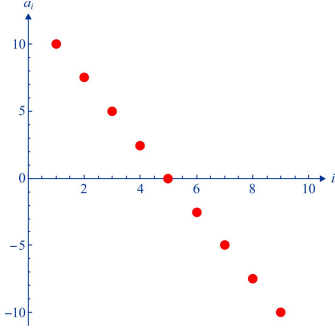
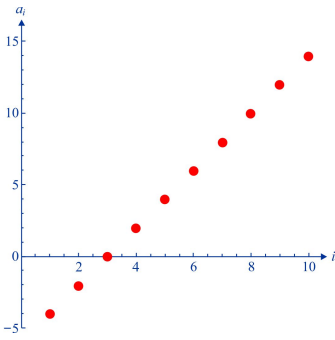
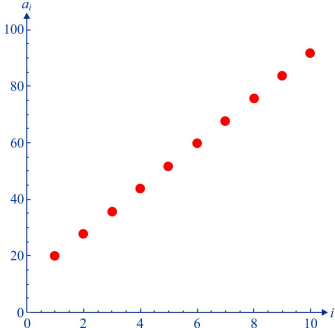
3. a) 2, 6, 10, 14, 18
 b) 50, 47, 44, 41, 38
 c) 5, 10, 20, 40, 80
 d) 1, -2, 4, -8, 16
4. a) $a_n = 2 + 4(n - 1)$
 b) $a_n = 50 - 3(n - 1)$
 c) $a_n = 5 \cdot 2^{n-1}$
 d) $a_n = (-2)^{n-1}$
5. a) 0, 10, -40, 210, -1040
 b) 1024, 256, 64, 16, 4
 c) 3, $1/3$, 3, $1/3$, 3
 d) 2, 4, 16, 256, 65536
6. a) $1, \frac{1}{2}, \frac{1}{6}, \frac{1}{24}, \frac{1}{220}$
 b) $1, \frac{1}{2}, \frac{2}{3}, \frac{3}{2}, \frac{24}{5}$
 c) $-\frac{1}{2}, \frac{1}{24}, -\frac{1}{720}, \frac{1}{40320}, -\frac{1}{3628800}$
7. a) 30
 b) $\frac{1}{336}$
 c) 35
 d) 14
 e) $\frac{1}{n}$
 f) $n(n + 1)$
8. 610
9. a) $a_n = 2 + 5(n - 1)$
 b) $a_n = 1000 - 25(n - 1)$
 c) $a_n = 5 \cdot 3^{n-1}$
 d) $a_n = 1000 \cdot (\frac{1}{10})^{n-1}$
10. 1; 50,5; 26,24009901; 15,02553012; 10,84043467; 10,03257851; 10,00005290; 10,00000000.

7.2 Somatórios

1. a) 2
 b) 100
 c) $25/48$
 d) $19/10$
 e) $21/10$
 f) 0
 g) -22
 h) $3/17$
 i) 7
 j) 6
2. a) $\sum_{i=1}^{200} i$
 b) $\sum_{i=1}^{200} \frac{i}{2}$
 c) $\sum_{i=1}^{100} \sqrt{i}$
 d) $\sum_{i=1}^{200} (-1)^i i$
 e) $\sum_{i=1}^{10} i^2$
 f) $\sum_{i=1}^5 3^i$
 g) $\sum_{i=1}^{50} \frac{1}{i(i+1)}$
 h) $\sum_{i=1}^{10} \frac{i^2}{i!}$
 i) $\sum_{i=1}^{10} (3 + 5i)$
 j) $\sum_{i=1}^{10} (-x)^{i-1}$

3. a) 10000 d) 14400 g) 1000
 b) 9900 e) 2460
 c) 2565 f) 3030 h) 420
4. a) 3030 c) 4020
 b) 11375 d) 4545
5. 100.500
6. a) 25 b) 2 c) 5 d) 20
7. $a_1 - a_7$.
8. A soma é igual a $\frac{6}{7}$.
9. ...

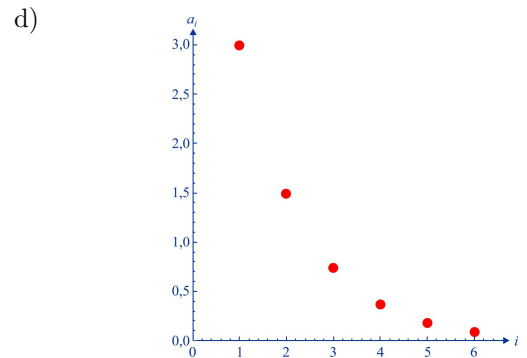
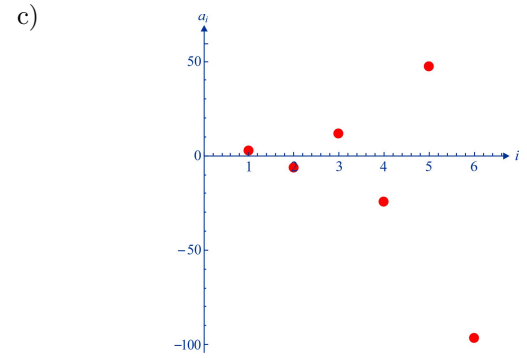
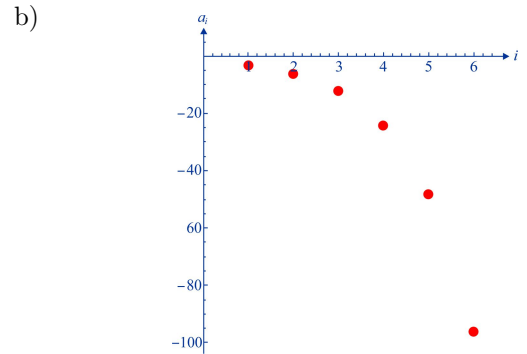
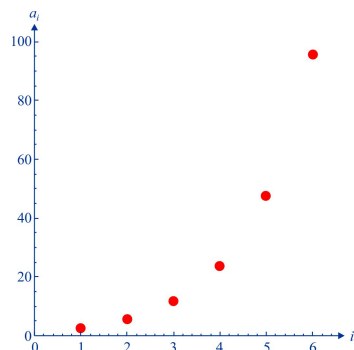
7.3 Progressões aritméticas

1. a) $a_n = 500 - 25(n - 1)$, $a_{21} = 0$
 b) $a_n = \frac{1}{3} + \frac{n-1}{6}$, $a_{35} = 6$
 c) $a_n = -100 + 4(n - 1)$, $a_{51} = 100$
 d) $a_n = \sqrt{2} + 3\sqrt{2}(n - 1)$, $a_{18} = 55\sqrt{2}$
2. a) $a_n = 4 - 3(n - 1)$. $a_{12} = -29$
 b) $a_n = -12, 5 + 5, 5(n - 1)$. $a_{10} = 37$
 c) $a_n = -\frac{3}{2} + \frac{5}{2}(n - 1)$. $a_{20} = 46$
 d) $a_n = 2\pi + 4\pi(n - 1)$. $a_{25} = 102\pi$
3. $a_n = 21 + \frac{4}{3}(n - 1)$
4. $a_n = 220 - 4(n - 1)$
5. $a_n = 500 + 5(n - 1)$
6. $a_n = \frac{9}{2} - \frac{n-1}{6}$
- 7.
- 
- 8.
- 
- 9.
- 
10. $a_n = \frac{5}{2} + \frac{11}{2}(n - 1)$
11. $x = 2$, $a_n = 9 + 10(n - 1)$
12. 14; 7,5; 1 $a_n = 14 - \frac{13}{2}(n - 1)$
13. 5, 12, 19 $a_n = 5 + 7(n - 1)$
14. 15, 9, 3 $a_n = 15 - 6(n - 1)$
15. $a_n = 8 + 8(n - 1)$
16. a) 2550 b) 10100 c) 1010
17. a) $a_n = 800 - 45(n - 1)$
 b) No sexto mês, ou seja, daqui a cinco meses.
18. a) 148
 b) 760 ladrilhos cinza e 840 ladrilhos brancos.
19. O site terá 10000 membros em 12 semanas.
20. a) 20 poltronas
 b) $a_n = 16 + 4n$
 c) 2340 poltronas
21. 20 fileiras
22. a) 400 m, 600 m, 800 m e 1000 m
 b) $a_n = 200n + 200$
 c) $S_{20} = 46$ km
23. a) $a_i = 15 + 1,5(i - 1)$
 b) 19 semanas
 c) 3790,5 km
24. a) $F_i = 3i$. $F_{10} = 30$
 b) 15 figuras
25. a) $a_i = 60 - 3,98(i - 1)$
 b) 15 ecos, ou seja, o 16º som.
26. 399 toras
27. a) $a_n = 1500 - 75(n - 1)$
 b) R\$ 675,00
 c) R\$ 15.750,00
28. a) $a_n = 1,2 + 0,2(n - 1)$
 b) 15 tábuas
29. a) $a_i = 36 + 12(i - 1)$
 b) 156 km²
 c) 15 anos
30. $a_n = 75 - 0,9(n - 1)$

- b) 30,9 anos
 c) Aos 84 anos
31. a) $a_n = 393,25 + 6(n - 1)$
 b) 537,25 MHz
 c) O canal 54
32. a) $1 + 0,5(i - 1)$ cm
 b) 247,5 cm
- c) 45 segmentos
33. a) $a_i = 240 + 40(n - 1)$
 b) R\$ 680,00
 c) 150.000 km
34. a) $a_i = 80 + 10(i - 1)$
 b) Em 25 anos

7.4 Progressões geométricas

1. a) 3, 12, 48, 192
 b) 2, ?6, 18, ?54
 c) $-1, -1/2, -1/4, -1/8$
 d) $3, 3\sqrt{2}, 6, 6\sqrt{2}$
2. a) É uma p.g. de razão 3
 b) É uma p.g. de razão 2
 c) É uma p.g. de razão a
 d) Não é uma p.g.
 e) É uma p.g. de razão $-a^2$
 f) Não é uma p.g.
3. a) $a_n = \frac{3}{2} \cdot 5^{n-1}, a_7 = \frac{46875}{2}$
 b) $a_n = -4 \cdot 3^{n-1}, a_5 = -324$
 c) $a_n = 2 \cdot (-1)^{n-1}, a_{100} = -2$
 d) $a_n = 10 \cdot \left(\frac{1}{2}\right)^{n-1}, a_{10} = \frac{10}{1024} = \frac{5}{512}$
 e) $a_n = \frac{3}{2} \left(-\frac{2}{3}\right)^{n-1}, a_8 = -\frac{64}{729}$
 f) $a_n = \sqrt{6} (\sqrt{3})^{n-1}, a_6 = 27\sqrt{2}$
4. a) $a_n = 4 \cdot 3^{n-1}, a_{10} = 78732$
 b) $a_n = \left(\frac{1}{5}\right) 5^{n-1}, a_7 = 3125$
 c) $a_n = 2 \left(-\frac{1}{2}\right)^{n-1}, a_{10} = -\frac{1}{256}$
 d) $a_n = 5 \left(\frac{1}{3}\right)^{n-1}, a_8 = \frac{5}{2187}$
5. $5, 5\sqrt{5}, 25, 25\sqrt{5}, 125, 125\sqrt{5}, 625$
6. 6, 18, 54, 162, 486, 1458
7. $x = 4, a_n = 4 \cdot 2^{n-1}$
8. $x = -2, a_n = -2 \cdot 3^{n-1}$
9. $x = 11, a_n = 16 \left(\frac{3}{4}\right)^{n-1}$
10. $a_n = 16 \left(\frac{1}{2}\right)^{n-1}$
11. $\sqrt{2}/16$
12. a)



13. a) $S_{10} = 1048575$
 b) $S_{10} = -29524$
 c) $S_{10} = \frac{1023}{512}$
 d) $S_{10} = 93 + 93\sqrt{2}$
14. a) $S_6 = 5859$
 b) $S_6 = -1456$
 c) $S_6 = 0$
 d) $S_6 = \frac{315}{16} = 19,6875$
 e) $S_6 = \frac{133}{162} = 0,820988$
 f) $S_6 \approx 86,9977$

