

3.7 corrigé

## Feuille de travail

$$1.a) \quad \frac{1}{2} - \frac{1}{6} = \frac{1}{3} \quad d = \frac{1}{3}$$

$$\frac{5}{6} - \frac{1}{2} = \frac{1}{3} \quad a = \frac{1}{6}$$

$$i) \quad t_n = \frac{1}{6} + (n-1)\frac{1}{3}$$

$$t_n = \frac{1}{6} + \frac{1}{3}n - \frac{1}{3}$$

$$t_n = -\frac{1}{6} + \frac{n}{3}$$

$$ii) \quad S_{15} = \frac{15}{2} \left( 2\left(\frac{1}{6}\right) + (15-1)\frac{1}{3} \right)$$

$$S_{15} = \frac{15}{2} \left( \frac{1}{3} + \frac{14}{3} \right)$$

$$S_{15} = \frac{15}{2} \left( \frac{15}{3} \right)$$

$$S_{15} = \frac{15}{2} \times 5$$

$$S_{15} = \frac{75}{2}$$

$$b) \quad t_1 = \log 3$$

$$t_2 = \log 9 = \log 3^2 = 2 \log 3$$

$$t_3 = \log 27 = 3 \log 3$$

$$t_4 = 4 \log 3$$

$$a = \log 3$$

$$d = \log 3$$

$$i) \quad t_n = n \log 3$$

$$ii) \quad S_{15} = \frac{15}{2} (\log 3 + 15 \log 3)$$

$$= \frac{15}{2} (16 \log 3)$$

$$= 120 \log 3$$

$$c) \quad t_1 = \sqrt{2}$$

$$t_2 = \sqrt{8} = 2\sqrt{2}$$

$$t_3 = \sqrt{18} = 3\sqrt{2}$$

$$t_4 = \sqrt{32} = 4\sqrt{2}$$

$$i) \quad t_n = n\sqrt{2}$$

$$ii) \quad S_{15} = \frac{15}{2} (\sqrt{2} + 15\sqrt{2})$$

$$= \frac{15}{2} (16\sqrt{2})$$

$$= 120\sqrt{2}$$

$$d) \begin{cases} S_8 = 52 \\ S_{16} = -88 \end{cases} \rightarrow \begin{cases} 52 = \frac{8}{2} (2a + 7d) \rightarrow (52 = 8a + 28d) \\ -88 = \frac{16}{2} (2a + 15d) \rightarrow -88 = 16a + 120d \end{cases}$$

$$-104 = -16a - 56d$$

$$-88 = 16a + 120d$$

$$\hline -192 = 64d$$

$$-3 = d$$

$$52 = 8a + 28(-3)$$

$$136 = 8a$$

$$17 = a$$

$$i) t_n = 17 + (n-1)(-3) \quad ii) S_{15} = \frac{15}{2} (2(17) + 14(-3))$$

$$t_n = 20 - 3n$$

$$= \frac{15}{2} (34 - 42)$$

$$= \frac{15}{2} (-8)$$

$$= -60$$

e) → page suivante

$$2a) 9 + 19 + \dots + 1999$$

$$t_n = 9 + (n-1)(10)$$

$$t_n = 10n - 1$$

$$1999 = 10n - 1$$

$$2000 = 10n$$

$$200 = n$$

$$S_{200} = \frac{200}{2} (9 + 1999)$$

$$= 100 \times 2008$$

$$= 200800$$

$$1. a) \quad t_5 = 16 \rightarrow (16 = a + 4d)^{x-20}$$

$$s_{20} = 650 \rightarrow 650 = \frac{20}{2} (2a + 19d)$$

$$\begin{array}{r} 650 = 20a + 190d \\ -320 = -20a - 90d \\ \hline 330 = 10d \\ 3 = d \end{array}$$

$$16 = a + 4(3)$$

$$a = 4$$

$$i) \quad t_n = 4 + (n-1)3$$

$$t_n = 3n + 1$$

$$ii) \quad s_{15} = \frac{15}{2} (2(4) + 14(3))$$

$$s_{15} = \frac{15}{2} (8 + 42)$$

$$= \frac{15}{2} \times 50$$

$$= 375$$

$$2. b) \quad 125 + 119 + 113 + \dots - 115$$

$$a = 125 \quad t_n = 125 + (n-1)(-6)$$

$$d = -6 \quad t_n = 131 - 6n$$

$$-115 = 131 - 6n$$

$$6n = 131 + 115$$

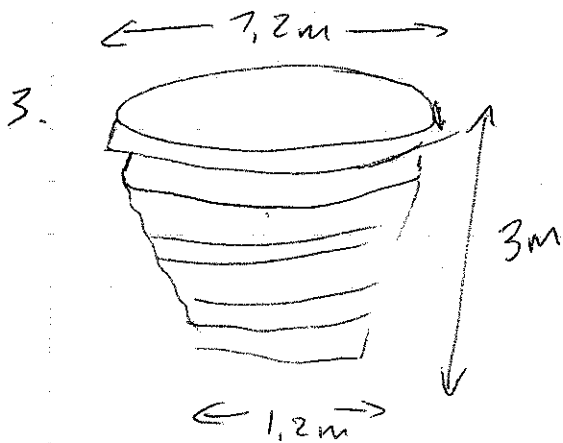
$$6n = 246$$

$$n = 41$$

$$s_{41} = \frac{41}{2} (125 - 115)$$

$$= \frac{41}{2} \times 10$$

$$= 205$$



$$r_1 = 0,6 \quad r_{11} = 3,6$$

$$t_n = a + (n-1)d$$

$$r \quad 3,6 = 0,2 + 10d$$

$$3,4 = 10d$$

$$0,34 = d$$

$$L = 2\pi r_1 + 2\pi r_2 + \dots + 2\pi r_{11}$$

$$= 2\pi (r_1 + r_2 + \dots + r_{11})$$

$$= 2\pi S_{11}$$

$$= 2\pi (3,1)$$

$$= 145,1 \text{ AT}$$

$$S_{11} = \frac{11}{2} (0,6 + 3,6)$$

$$= 23,1$$



4

$$S_5 = 5000 \quad d = 100$$

$$5000 = \frac{5}{2} (2a + 4(100))$$

$$5000 = 5a + 1000$$

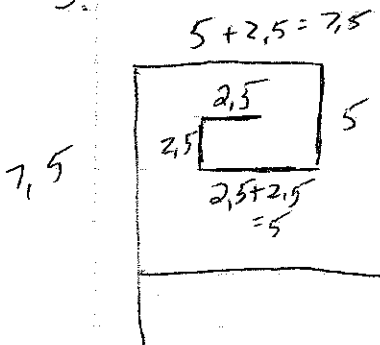
$$4000 = 5a$$

$$a = 800$$

$$t_5 = 800 + 4(100)$$

$$t_5 = 1200$$

5.



$$a = 2,5$$

$$d = 2,5$$

$$t_n = 2,5n$$

$$t_n = 40$$

$$40 = 2,5n$$

$$16 = n$$

$$L = 2 \times S_{16}$$

$$= 2 \left( \frac{16}{2} (2,5 + 40) \right)$$

$$= 2 \times 340$$

$$= 680 \text{ cm}$$

6. a)



$$d=1 \Rightarrow r=1/2$$

$$A = \pi (1/2)^2$$

$$A = \pi/4$$

$$t_1 = \pi/4$$



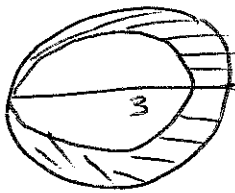
$$d=2 \Rightarrow r=1$$

$$A = \pi (1)^2 - \pi (1/2)^2$$

$$= \pi - \pi/4$$

$$= 3\pi/4$$

$$t_2 = 3\pi/4$$



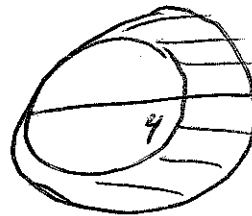
$$d=3 \Rightarrow r=3/2$$

$$A = \pi (3/2)^2 - \pi (1)^2$$

$$= \frac{9\pi}{4} - \pi$$

$$= \frac{5\pi}{4}$$

$$t_3 = 5\pi/4$$



$$d=4 \Rightarrow r=2$$

$$A = \pi (2)^2 - \pi (3/2)^2$$

$$= 4\pi - \frac{9\pi}{4}$$

$$= \frac{7\pi}{4}$$

$$t_4 = 7\pi/4$$

b)  $a = \pi/4$

$$d = \pi/2$$

$$n = 25$$

$$t_n = a + (n-1)d$$

$$t_{25} = \frac{\pi}{4} + (25-1)\pi/2$$

$$= \frac{\pi}{4} + 12\pi$$

$$= \frac{49\pi}{4}$$

c)  $S_{10}$

Algèbre

$$S_n = \frac{n}{2} (2a + (n-1)d)$$

$$S_{10} = \frac{10}{2} (2(\pi/4) + 9(\pi/2))$$

$$= 5 (\pi/2 + 9\pi/2)$$

$$= 5 (\frac{10\pi}{2})$$

$$= 5 (5\pi)$$

$$= 25\pi$$

Géométrie

$S_{10} \rightarrow$  aire

d'un cercle  
de diamètre 10.

$$S_{10} = \pi (5)^2 \quad (r=5)$$

$$S_{10} = 25\pi$$

$$7. a) a = -15$$

$$d = 6$$

$$s_n = 840$$

$$s_n = \frac{n}{2} (2a + (n-1)d)$$

$$840 = \frac{n}{2} (2(-15) + (n-1)6)$$

$$840 = -15n + 3n(n-1)$$

$$840 = -15n + 3n^2 - 3n$$

$$\frac{0}{3} = \frac{3n^2 - 18n - 840}{3}$$

$$0 = n^2 - 6n - 280$$

$$0 = n^2 - 20n + 14n - 280$$

$$0 = n(n-20) + 14(n-20)$$

$$0 = (n-20)(n+14)$$

$$\downarrow \quad \searrow$$

$$\textcircled{n=20} \quad n = \cancel{14}$$

$$b) t_n = 67 - 7n$$

$$t_1 = 60$$

$$t_2 = 53$$

$$t_3 = 46$$

$$a = 60$$

$$d = -7$$

$$s_n = -3507$$

$$s_n = \frac{n}{2} (2a + (n-1)d)$$

$$-3507 = \frac{n}{2} (2(60) + (n-1)(-7))$$

$$-3507 \times 2 = 60n - \frac{7n}{2} (n-1) \times 2$$

$$-7014 = 120n - 7n(n-1)$$

$$-7014 = 120n - 7n^2 + 7n$$

$$7n^2 + 7n - 7014 - 120n = 0$$

$$7n^2 - 113n - 7014 = 0$$

$$n = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{113 \pm \sqrt{(113)^2 - 4(7)(-7014)}}{2(7)}$$

$$= \frac{113 \pm \sqrt{212521}}{14}$$

$$= \frac{113 \pm 461}{14}$$

$$\textcircled{n=42}$$

$$n = \frac{-334}{14}$$

$$\cancel{n = \frac{574}{7}}$$