

1.  $S_n = 168$   
 $r = -2$

$$168 = \frac{a(1 - (-2)^n)}{1 - (-2)}$$

$$168 = -21a$$

$$a = -8$$

$t_n = (-8)(-2)^{n-1}$   
 $t_n = (-2)^3 \cdot (-2)^{n-1}$   
 $t_n = (-2)^{n+2}$

2.  $t_3 = 25 \Rightarrow ar^2 = 25$   
 $t_5 = 1 \Rightarrow ar^4 = 1$

$$\frac{ar^4}{ar^2} = \frac{1}{25}$$

$$r^2 = \frac{1}{25}$$

$$r = \pm \frac{1}{5}$$

①  $r = \frac{1}{5}$   
 $a(\frac{1}{5})^2 = 25$   
 $a = 625$

②  $r = -\frac{1}{5}$   
 $a(-\frac{1}{5})^2 = 25$   
 $a = 625$

①  $S_8 = \frac{625(1 - (\frac{1}{5})^8)}{1 - \frac{1}{5}}$   
 $= \frac{97656}{125}$

②  $S_8 = \frac{625(1 - (-\frac{1}{5})^8)}{1 - (-\frac{1}{5})}$   
 $= \frac{65104}{125}$

3.  $a = 16$  (0 re bond)  
 $r = \frac{3}{4}$   
 $t_6 = ?$

$$t_6 = 16(\frac{3}{4})^5$$

$$= 3,796875$$

4.  $a = 12$   
 $d = -1$   
 $t_n = 1$

$$1 = 12 + (n-1)(-1)$$

$$1 = 12 - n + 1$$

$$n = 12$$

$S_{12} = \frac{12}{2}(1 + 12)$   
 $= 6 \times 13$   
 $= 78$

$$5. a = 1 \text{ (0 division)}$$

$$r = 2 \quad t_{11} = 1(2)^{11-1}$$

$$n = 11 \quad = 1024$$

$$t_{10} = ?$$

$$6. a = 0,8 \times 65 \quad S_5 = \frac{52(1 - 0,8^5)}{1 - 0,8}$$

$$a = 52$$

$$r = 0,8$$

$$n = 5$$

$$S_5 = 174,8$$

↳ 175 monts

$$7. t_4 = 215$$

$$t_n = 330$$

$$a + 3d = 215$$

$$a + 8d = 330$$


---


$$-5d = -115$$

$$d = 23$$

Après 19 semaines

$$a = 215 - 3(23)$$

$$a = 146$$

$$t_n = 560, n = ?$$

$$560 = 146 + (n-1)23$$

$$414 = 23n - 23$$

$$437 = 23n$$

$19 = n$

$$8. \frac{60}{5} = 12 \text{ transmissions}$$

$$a = 2 \text{ (0 transmission)}$$

$$S_n = ?$$

$$n = 13$$

$$r = 2$$

$$S_{13} = \frac{2(1 - 2^{13})}{1 - 2}$$

$$= 16382$$

$$16382 + 1 = \boxed{16383}$$

$$9. \quad 5200 - 1500 = 3700$$

$$a = 3700 \text{ (1st)} \quad 1300 = 3700 + (n-1)(-600)$$

$$d = -600$$

$$1300 = 3700 - 600n + 600$$

$$t_n = 1300$$

$$\frac{-3000}{-600} = \frac{-600n}{-600}$$

$$5 = n$$

Same

$$10. \quad (7+8+\dots+12) + (1+\dots+8)$$

$$\frac{6}{2}(7+12) + \frac{8}{2}(1+8)$$

$$57 + 36$$

$$93$$

$$11. \quad a = 80000 \text{ (0th)}$$

$$r = ?$$

$$n = 4$$

$$t_n = 106480$$

$$\frac{106480}{80000} = \frac{80000r^4}{80000}$$

$$1.331 = r^4$$

$$1.1 = r$$

$$\bar{i} = 10\%$$

$$12. \quad a = 3$$

$$d = 3$$

$$n = 15$$

$$t_{15} = ?$$

$$t_{15} = 3 + (15-1)(3)$$

$$t_{15} = 45$$

$$13. S_{30} = 100\,000$$

$$r = 1,03$$

$$a = ?$$

$$a(1,03)^{30} + a(1,03)^{29} + \dots + \underline{\underline{ar}}$$

$$b) 100\,000 - 2040,70 \times 30 = 38\,779 \text{ ¢}$$

$$100\,000 = \frac{a(1,03^{30})}{1 - 1,03}$$

$$100\,000 = 47,57 a$$

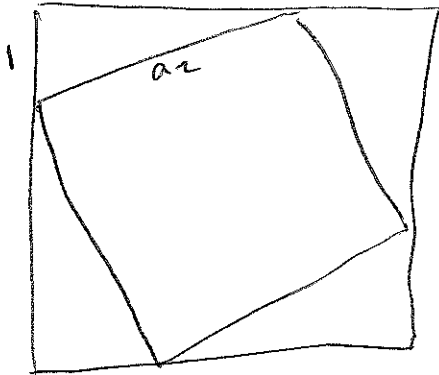
$$2101,93 = a$$

$$\text{Mas } a \Rightarrow ar$$

$$2101,93 = 1,03 a$$

$$a = 2040,70 \text{ ¢}$$

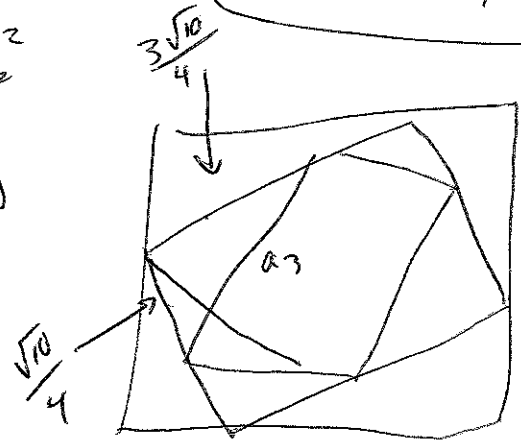
$$14. a) a_1 = 4$$



$$1^2 + 3^2 = a_2^2$$

$$a_2^2 = 10$$

$$a_2 = \sqrt{10}$$



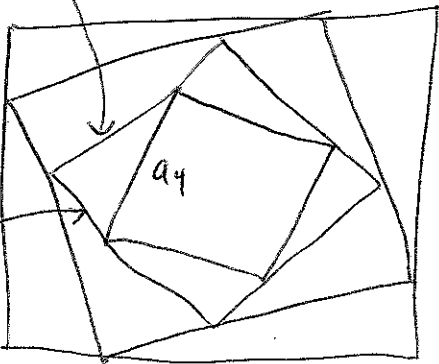
$$\left(\frac{\sqrt{10}}{4}\right)^2 + \left(\frac{3\sqrt{10}}{4}\right)^2 = a_3^2$$

$$\frac{10}{16} + \frac{90}{16} = a_3^2$$

$$\frac{100}{16} = a_3^2$$

$$\frac{25}{4} = a_3^2 \Rightarrow a_3 = \frac{5}{2}$$

$$\frac{3}{4} \left(\frac{5}{2}\right) = \frac{15}{8}$$



$$a_4^2 = \left(\frac{5}{8}\right)^2 + \left(\frac{15}{8}\right)^2$$

$$= \frac{25}{64} + \frac{225}{64}$$

$$\sqrt{a_4^2} = \sqrt{\frac{250}{64}}$$

$$a_4 = \frac{\sqrt{250}}{8}$$

$$a_4 = \frac{5\sqrt{10}}{8}$$

19. b)

$$\{a_n\} = \{4, \sqrt{10}, \frac{5}{2}, \frac{5\sqrt{10}}{8}, \dots\}$$

$$a = 4$$

$$r = \frac{\sqrt{10}}{4}$$

$$\begin{aligned} a_n &= 4 \left(\frac{\sqrt{10}}{4}\right)^{n-1} \\ &= 4 \cdot \left(\frac{1}{4}\right)^{n-1} \cdot (\sqrt{10})^{n-1} \\ &= \left(\frac{1}{4}\right)^{n-1} \cdot \left(\frac{1}{4}\right)^{n-1} \cdot (10)^{\frac{n-1}{2}} \\ &= \left(\frac{1}{4}\right)^{n-2} \cdot 10^{\frac{n-1}{2}} \\ &= (4)^{2-n} \cdot 10^{\frac{n-1}{2}} \end{aligned}$$

$$P_1 = 4(4) = 16$$

$$P_2 = 4(\sqrt{10}) = 4\sqrt{10}$$

$$P_3 = 4\left(\frac{5}{2}\right) = 10$$

$$\begin{aligned} P_n &= 4(a_n) \\ &= 4 \left(\frac{1}{4}\right)^{n-2} (10)^{\frac{n-1}{2}} \\ &= \left(\frac{1}{4}\right)^{n-3} \cdot \left(\frac{1}{4}\right)^{n-2} \cdot (10)^{\frac{n-1}{2}} \\ &= \left(\frac{1}{4}\right)^{n-3} \cdot 10^{\frac{n-1}{2}} \\ &= 4^{3-n} \cdot 10^{\frac{n-1}{2}} \end{aligned}$$

$$A_1 = 4 \times 4 = 16$$

$$A_2 = \sqrt{10} \times \sqrt{10} = 10$$

$$A_3 = \frac{5}{2} \cdot \frac{5}{2} = \frac{25}{4}$$

$$\begin{aligned} A_n &= a_n^2 \\ &= \left(4^{2-n} \cdot 10^{\frac{n-1}{2}}\right)^2 \\ &= 4^{4-2n} \cdot 10^{n-1} \end{aligned}$$

c)  $P_1 = 16, r = \frac{\sqrt{10}}{4}$

$$\begin{aligned} S_{40} &= \frac{16 \left(1 - \left(\frac{\sqrt{10}}{4}\right)^{40}\right)}{1 - \frac{\sqrt{10}}{4}} \\ &= 16 \dots \end{aligned}$$

d)  $a = C^2$

$$r = \frac{10}{16} = \frac{5}{8}$$

$$S_4 = 1057$$

$$1057 = \frac{a \left(1 - \left(\frac{5}{8}\right)^4\right)}{1 - \frac{5}{8}}$$

$$1057 = \frac{1157a}{512}$$

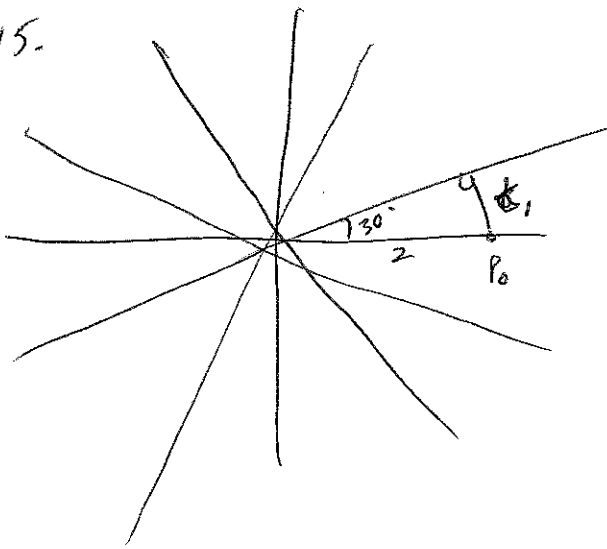
$$a = 512$$

$$C^2 = 512$$

$$C = \sqrt{512}$$

$$C = 16\sqrt{2}$$

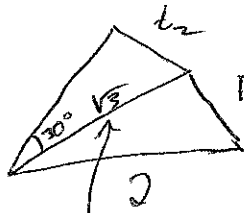
15.



$$\sin 30^\circ = \frac{t_1}{2}$$

$$2 \sin 30^\circ = t_1$$

$$\boxed{t_1 = 1} \quad P_0 P_1$$



$$x^2 + t_2^2 = 2^2$$

$$x^2 = 4 - 1$$

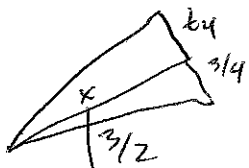
$$x^2 = 3$$

$$x = \sqrt{3}$$

$$\frac{t_2}{\sqrt{3}} = \sin 30^\circ$$

$$t_2 = \sqrt{3} \sin 30^\circ$$

$$\boxed{t_2 = \frac{\sqrt{3}}{2}} \quad P_1 P_2$$



$$x^2 = \left(\frac{3}{2}\right)^2 - \left(\frac{3}{4}\right)^2$$

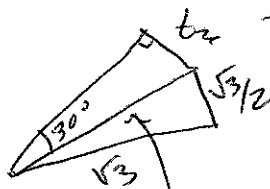
$$x^2 = \frac{9}{4} - \frac{9}{16}$$

$$= \frac{36}{16} - \frac{9}{16}$$

$$= \frac{27}{16}$$

$$x = \frac{\sqrt{27}}{4}$$

$$x = \frac{3\sqrt{3}}{4}$$



$$x^2 + \left(\frac{\sqrt{3}}{2}\right)^2 = \left(\frac{3}{2}\right)^2$$

$$x^2 = \frac{9}{4} - \frac{3}{4}$$

$$x^2 = \frac{6}{4}$$

$$x = \frac{3}{2}$$

$$\frac{t_4}{3\sqrt{3}/4} = \sin 30^\circ$$

$$t_4 = \frac{3\sqrt{3}}{4} \sin 30^\circ$$

$$\boxed{t_4 = \frac{3\sqrt{3}}{8}} \quad P_3 P_4$$

$$\frac{t_3}{3/2} = \sin 30^\circ$$

$$t_3 = \frac{3}{2} \sin 30^\circ$$

$$\boxed{t_3 = 3/4} \quad P_2 P_3$$

$$b) \frac{360^\circ}{30^\circ} = 12$$

$$n = 12$$

$$a = 1$$

$$r = \frac{\sqrt{3}/2}{\sqrt{3}/2} = \frac{\sqrt{3}}{\sqrt{3}}$$

$$S_{12} = \frac{1 \left( 1 - \left( \frac{\sqrt{3}}{\sqrt{3}} \right)^{12} \right)}{1 - \frac{\sqrt{3}}{\sqrt{3}}} = \frac{24}{1} \text{ cm} = 24,13$$

$$c) n = 24$$

$$S_{24} = \frac{1 - \left( \frac{\sqrt{3}}{\sqrt{3}} \right)^{24}}{1 - \frac{\sqrt{3}}{\sqrt{3}}} = 7,23$$

$$7,23 - 6,13 = 1,10 \text{ cm}$$