

Revision Supp. M-bloc

1. $a = 20 \text{ mg}$
 $y = 17 \text{ mg}$
 $x = 5 \text{ min}$
 $B = 1/2$
 $b = ?$

$$f(x) = a(B)^{x/b}$$

$$\frac{17}{20} = \frac{20}{20} \left(\frac{1}{2}\right)^{5/b}$$

$$0.85 = \left(\frac{1}{2}\right)^{5/b}$$

$$\log_{1/2} 0.85 = \frac{5}{b}$$

$$0.234 = \frac{5}{b}$$

$$b = 21.3 \text{ minutes}$$

b) $x = ?$
 $f(x) = 1 \text{ mg}$

$$\frac{1}{20} = \frac{20}{20} \left(\frac{1}{2}\right)^{x/21.3}$$

$$\log_{1/2} \frac{1}{20} = \frac{x}{21.3}$$

$$4.32 = x/21.3$$

$$92.06 = x$$

min

2. $a = 10 \text{ mg}$
 $f(x) = 9 \text{ mg}$
 $x = 3 \text{ m.}$
 $B = 1/2$
 $b = ?$

$$f(x) = a(B)^{x/b}$$

$$\frac{9}{10} = \frac{10}{10} \left(\frac{1}{2}\right)^{3/b}$$

$$0.9 = \left(\frac{1}{2}\right)^{3/b}$$

$$\log_{1/2} 0.9 = \frac{3}{b}$$

$$0.152 = \frac{3}{b}$$

$$b = 19.7$$

3. Résous

a) $3^{2x} = 7(3^x) - 12$
 $3^{2x} - 7(3^x) + 12 = 0$

Sup. $3^x = a$
 $a^2 - 7a + 12 = 0$

$$(a-4)(a+3) = 0$$

$$a = 4 \quad a = -3$$

$$3^x = 4 \quad 3^x = -3$$

$$\log_3 4 = x$$

$$x = 1.26$$

$$\log_3 -3 = x$$

aucune solution

b) $5^x = 3 - 5^{2x}$

$$(5^x)^2 + (5^x) - 3 = 0$$

Sup. $5^x = a$

$$a^2 + a - 3 = 0$$

$$x = \frac{-1 \pm \sqrt{1 - 4(1)(-3)}}{2} =$$

$$1.303 \text{ ou } -2.303$$

$$5^x = 1.303 \quad \text{ou} \quad 5^x = -2.303$$

$$\log_5 1.303 = x$$

$$x = 0.16$$

à rejeter

$$3c) \frac{8(3)^{2x+3}}{8} = \frac{24}{8}$$

$$3^{2x+3} = 3^1$$

$$2x+3=1$$

$$2x=-2$$

$$x=-1$$

$$d) \frac{18}{2} = \frac{2(9)^{2x-1}}{2}$$

$$9^1 = 9^{2x-1}$$

$$1 = 2x-1$$

$$2=2x$$

$$1=x$$

$$e) 3^x + 1 + 56(3^{-x}) = 0$$

$$\frac{3^{2x} + 3^x + 56}{3^x} = 0$$

$$\text{Sup. } 3^x = a$$

$$a^2 + a + 56 = 0$$

~~X~~

$$f) 4^x = 3 + 18(4^{-x})$$

~~X~~

$$g) 2^{4x} = 4^{x+3}$$

$$2^{4x} = (2^2)^{x+3}$$

$$2^{4x} = 2^{2x+6}$$

$$4x = 2x + 6$$

$$2x = 6$$

$$x = 3$$

$$h) 3^{x+1} = 9^{x-1}$$

$$3^{x+1} = (3^2)^{x-1}$$

$$x+1 = 2x-2$$

$$3 = x$$

$$4. B = 1/2$$

$$b = 20 \text{ h}$$

$$x = ?$$

$$y = 0.9$$

$$a = 1$$

$$y = a(B)^{t/b} + k$$

$$0.9 = 1(1/2)^{20/20}$$

$$\log_{1/2} 0.9 = x/20$$

$$0.152 = \frac{x}{20}$$

$$x = 3.04 \text{ heures}$$

$$5. a = 24000 \text{ \$}$$

$$B = 1/2$$

$$x = t$$

$$b = 3$$

$$y = 24000(1/2)^{t/3}$$

$$\frac{6000}{24000} = \frac{24000(1/2)^{t/3}}{24000}$$

$$1/4 = (1/2)^{t/3}$$

$$1/4 = (1/2)^{t/3}$$

$$2 = t/3$$

$$6 = t$$

9. $\begin{bmatrix} 2 & x+y \\ 3 & -y \\ 1 & 9 \end{bmatrix} = \begin{bmatrix} 2 & x-y & 1 \\ 1 & -y & 9 \end{bmatrix}$ alors

$$\begin{aligned} x+y &= 1 & x-y &= 3 \\ x &= 1-y & 1-y-y &= 3 \\ \boxed{x=2} & & -2y &= 2 \\ & & \boxed{y=-1} & \end{aligned}$$

→ 10. a) Même que l'autre résuion

11. a) $\sqrt{128}$ $\begin{array}{r} 128 \overline{) 2} \\ 64 \overline{) 2} \\ 32 \overline{) 2} \\ 16 \overline{) 2} \\ 8 \overline{) 2} \\ 4 \overline{) 2} \\ 2 \overline{) 2} \\ 1 \end{array}$ b) $\sqrt[3]{500}$ $\begin{array}{r} 500 \overline{) 2} \\ 250 \overline{) 2} \\ 125 \overline{) 2} \\ 25 \overline{) 5} \\ 5 \overline{) 5} \\ 1 \end{array}$

$2 \times 2 \times 2 \sqrt{2}$
 $8\sqrt{2}$

$5\sqrt[3]{4}$

24 | 2 $\begin{array}{r} 600 \overline{) 2} \\ 300 \overline{) 2} \\ 150 \overline{) 2} \\ 75 \overline{) 5} \\ 15 \overline{) 5} \\ 3 \overline{) 3} \\ 1 \end{array}$ c) $3\sqrt{24} + 2\sqrt{600}$

$$\begin{aligned} & 3 \times 2\sqrt{6} + 2 \times 2 \times 5\sqrt{6} \\ & 6\sqrt{6} + 20\sqrt{6} \\ & 26\sqrt{6} \end{aligned}$$

12 a) $f(x) = 3x^2 - 7x - 6$

$$\begin{aligned} f(x) &= 3 \left[(x^2 - 7/3 x + 49/36) - 49/36 - 2 \right] \\ &= 3 \left[(x - 7/6)^2 - 49/36 - 72/36 \right] \\ &= 3 \left[(x - 7/6)^2 - 121/36 \right] \\ &= 3 \left[(x - 7/6)^2 - 121/12 \right] \end{aligned}$$

S $(7/6, -121/12)$

D = $]-\infty, \infty[$ I = $[-121/12, \infty[$

0 = $(3x-9)(3x+2)/3$

0 = $3(x-3)(3x+2)/3$

Zéros $x=3$ $x=-2/3$

$\nearrow [7/6, \infty[\searrow]-\infty, 7/6]$

+ $]-\infty, -2/3[\cup]3, \infty[$ - $[-2, 3]$

b) $3 | -2(x-3/2) | -4$

$$\begin{aligned} & 6 | x-3/2 | -4 \\ & D =]-\infty, \infty[\quad I = [-4, \infty[\end{aligned}$$

Zéros $6 | x-3/2 | = 4$

$$\begin{aligned} |x-3/2| &= 4/6 = 2/3 \\ x-3/2 &= 2/3 \quad \text{ou} \quad x-3/2 = -2/3 \end{aligned}$$

$\Rightarrow x = 13/6$ ou $x = 5/6$

$\nearrow [5/6, \infty[\searrow]-\infty, 5/6]$

+ $]-\infty, 5/6[\cup]13/6, \infty[$

- $[5/6, 13/6]$

E) D = $]-\infty, \infty[$ I = $]-3, \infty[$

Zéros $x=-3$

Pygamais $\searrow]-\infty, \infty[$

+ $]-\infty, -3[\cup]-\infty, \infty[$

c) D = $[0, 8]$

I = $[0, 4]$

Zéros 0 et 8

$\nearrow [0, 4] \searrow]2, 8]$

+ $[0, 8]$

D) D = $]-\infty, \infty[\cup]1, \infty[$

I = $]-\infty, 2[\cup]2, \infty[$

Zéro $x=0, 2$

Pygamais $\searrow]-\infty, \infty[\cup]1, \infty[$

+ $]-\infty, 0, 2[\cup]1, \infty[$

- $[0, 2; 1[$

AV $\Rightarrow x=1$ AH $\Rightarrow y=2$