

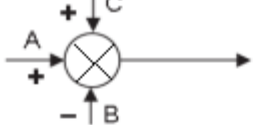
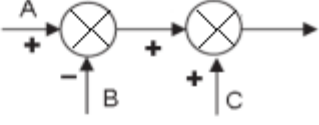
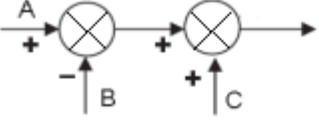
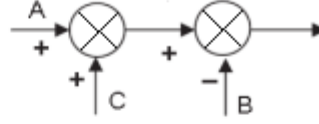

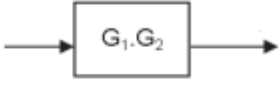
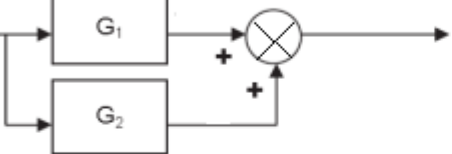
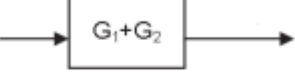
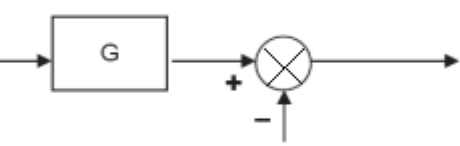
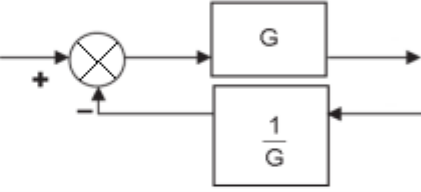
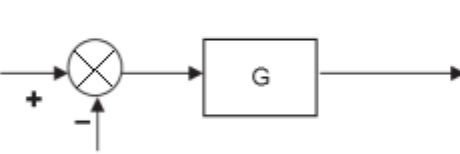
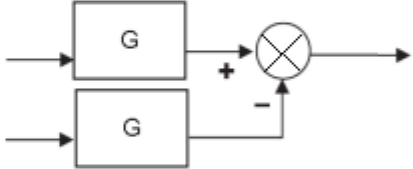
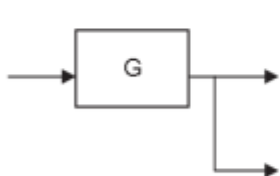
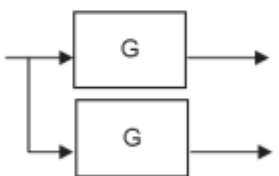
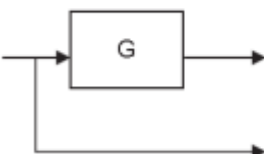
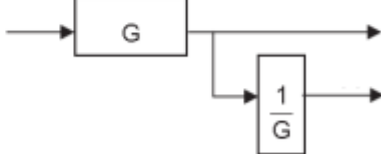

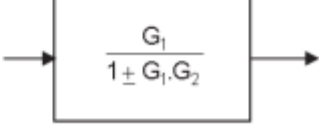
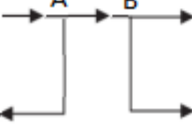

Schéma fonctionnel original	Schéma fonctionnel équivalent
<p>1</p> 	
<p>2</p> 	
<p>3</p> 	
<p>4</p> 	
<p>5</p> 	
<p>6</p> 	
<p>7</p> 	
<p>8</p> 	
<p>9</p> 	
<p>10</p> 	

Table n° 1 : Règles de transformation des schémas fonctionnels

$f(t) \quad t \geq 0$		$F(s)$	$f(t) \quad t \geq 0$		$F(s)$
1	Impulsion $\delta(t)$	1	A	$f(t)$	$F(s) = \int_0^{\infty} e^{-st} f(t) dt$
2	Echelon $\mu(t) = 1$	$\frac{1}{s}$	B	$\lambda_1 f_1(t) + \lambda_2 f_2(t) + \dots$	$\lambda_1 F_1(s) + \lambda_2 F_2(s) + \dots$
3	Rampe $r(t) = t$	$\frac{1}{s^2}$	C	$\frac{\partial f(t)}{\partial t}$	$s \cdot F(s) - f(0)$
4	Accélération $a(t) = t^2$	$\frac{2}{s^3}$	D	$\frac{\partial^2 f(t)}{\partial t^2}$	$s^2 \cdot F(s) - s \cdot f(0) - f'(0)$
5	t^n	$\frac{n!}{s^{n+1}}$	E	$\frac{\partial^n f(t)}{\partial t^n}$	$s^n \cdot F(s) - s^{n-1} \cdot f(0) - s^{n-2} \cdot f'(0) - \dots - f^{(n-1)}(0)$
6	e^{-at}	$\frac{1}{s+a}$	F	$\int_0^t f(t) dt$	$\frac{F(s)}{s}$
7	$1 - e^{-at}$	$\frac{a}{s(s+a)}$	G	$\int_0^t \int_0^t \dots \int_0^t f(t) dt^n$	$\frac{F(s)}{s^n}$
8	$e^{-at} - e^{-bt}$	$\frac{b-a}{(s+a)(s+b)}$	H	$t \cdot f(t)$	$-\frac{\partial F(s)}{\partial s}$
9	te^{-at}	$\frac{1}{(s+a)^2}$	I	$f(a \cdot t)$	$\frac{1}{a} F\left(\frac{s}{a}\right)$
10	$(1-at)e^{-at}$	$\frac{s}{(s+a)^2}$	J	$f\left(\frac{t}{a}\right)$	$a \cdot F(a \cdot s)$
11	$t^2 e^{-at}$	$\frac{2}{(s+a)^3}$	K	$e^{-at} \cdot f(t)$	$F(s+a)$
12	$at - 1 + e^{-at}$	$\frac{a^2}{s^2(s+a)}$	L	$f(t-\phi)$ $t \geq \phi$	$e^{-\phi s} F(s)$
13	$\sin(at)$	$\frac{a}{s^2 + a^2}$	M	$f(0^+) = \lim_{s \rightarrow \infty} \{s \cdot F(s)\}$	$f(\infty) = \lim_{s \rightarrow 0} \{s \cdot F(s)\}$
14	$\cos(at)$	$\frac{s}{s^2 + a^2}$	<ul style="list-style-type: none"> $f(t)$ est une fonction périodique de période T. $f_1(t)$ est une fonction définie sur la 1^{ère} période de $f(t)$ $F(s) = \frac{F_1(s)}{1 - e^{-sT}}$		
15	$e^{-at} \sin(bt)$	$\frac{b}{(s+a)^2 + b^2}$			
16	$e^{-at} \cos(bt)$	$\frac{s+a}{(s+a)^2 + b^2}$			
17	$e^{-at} \cos(bt + \phi)$	$\frac{\alpha s + \beta}{(s+a)^2 + b^2}$ $\begin{cases} \alpha = \cos(\phi) \\ \beta = a \cdot \cos(\phi) - b \cdot \sin(\phi) \end{cases}$			

Table N°2 : Transformée de Laplace directe et inverse