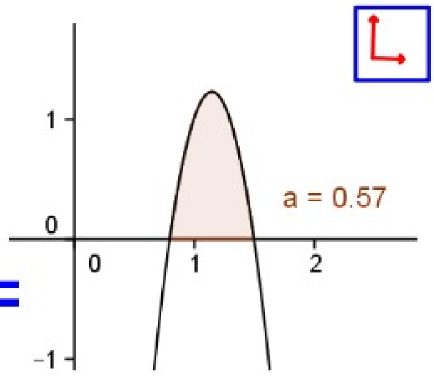
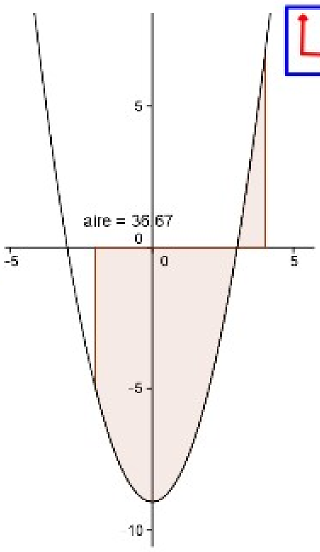
1) $f(x) = -10x^2 + 23x - 12$ et l'axe OX

	0.8		1.5	
-	0	+	0	-

$$A = \int_{0.8}^{1.5} -10x^2 + 23x - 12 \, dx =$$



2) $f(x) = x^2 - 9$, l'axe OX et les droites $x = -2$ et $x = 4$



	-3	(-2)		3	(4)
+	0		-	0	+

$$\mathcal{A} = -\underbrace{\int_{-2}^{3} x^2 - 9 \, dx}_{\int_{3}^{-2} x^2 - 9 \, dx} + \int_{3}^{4} x^2 - 9 \, dx$$

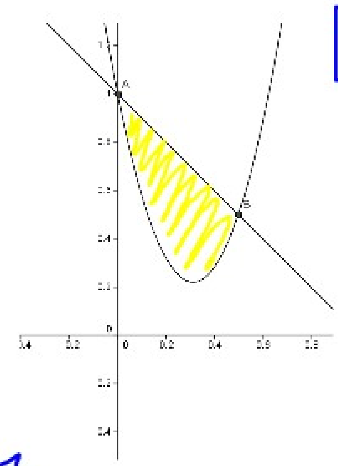
$$= \left. \frac{x^3}{3} - 9x \right]_{3\,;\,3}^{-2\,;\,4}$$

$$= \left(-\frac{8}{3} + 18 + \frac{64}{3} - 36\right) - 2.\left(9 - 27\right)$$

$$= 18 + \frac{56}{3}$$

$$= \frac{110}{3}$$

3) $f(x) = 8x^2 - 5x + 1$ et la droite $d \equiv y = 1 - x$



$f(x) = g(x)$? $\quad g(x) = 1 - x$.

$\Leftrightarrow f(x) - g(x) = 0$

$8x^2 - 5x + 1 - (1 - x) = 0$

$8x^2 - 4x = 0$

$4x(2x - 1) = 0$

$x = 0 \quad x = \frac{1}{2}$

		0		$\frac{1}{2}$	
$8x^2 - 4x$	+	0	−	0	+

$$\mathcal{A} = -\int_0^{\frac{1}{2}} 8x^2 - 4x \, dx$$

$$= \int_0^{\frac{1}{2}} 4x - 8x^2 \, dx$$

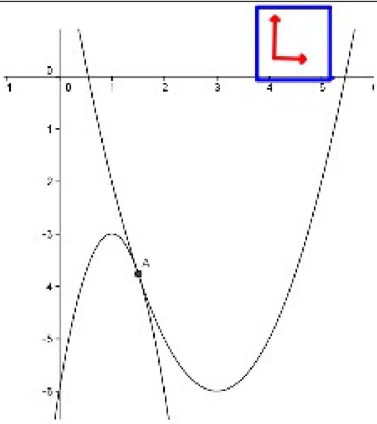
$$= *$$

$$* = 2x^2 - \frac{8x^3}{3} \Big]_0^{\frac{1}{2}}$$

$$= \frac{1}{2} - \frac{1}{3}$$

$$= \frac{1}{6}$$

4) $f(x) = x^2 - 6x + 3$ et la parabole $P \equiv y = -3x^2 + 6x - 6$



(y = $g(x)$)

$f(x) - g(x) = 0$

$4x^2 - 12x + 9 = 0$

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

$\Longrightarrow$ pas d'aire définie par les 2 paraboles

car les graphiques sont tangents

5) $C \equiv y = x^3 + 3x^2 - x - 3$ et l'axe OX

trouver les racines par Horner puis delta

	-3		-1		1	
$-$	0	$+$	0	$-$	0	$+$

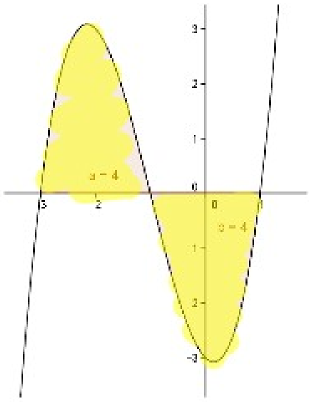
$$\int_{-3}^{-1} \dots - \left[\int_{-1}^{1} \dots \right] + \int_{1}^{-1} \dots$$

$$\mathcal{A} = \frac{x^4}{4} + \frac{3x^3}{3} - \frac{x^2}{2} - 3x \Big]_{-3;1}^{-1;-1}$$

$$= 2.\left(\frac{1}{4} - 1 - \frac{1}{2} + 3\right) - \left(\frac{81}{4} + (-27) - \frac{9}{2} + 9\right)$$

$$- \left(\frac{1}{4} + 1 - \frac{1}{2} - 3\right)$$

$$= 24 + 4 - 20 = 8$$



6) $C_1 \equiv y = x^3 - x^2 + 8x + 7$ et $C_2 \equiv y = 2x^3 + x^2 - 5x + 17$ pas de graphique

$f(x) - g(x) = 0$

$-x^3 - 2x^2 + 13x - 10 = 0$

$(x - 1)(x + 5)(2 - x) = 0$

	-5		1		2	
+	0	-	0	+	0	-

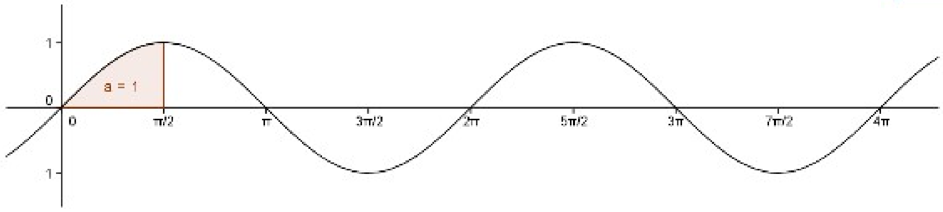
$$A = -\int_{-5}^{1}\left(-x^3 - 2x^2 + 13x - 10\right)dx + \int_{1}^{2}\left(-x^3 - 2x^2 + 13x - 10\right)dx$$

$$= \left[\frac{-x^4}{4} - \frac{2x^3}{3} + 13\frac{x^2}{2} - 10x\right]_{1;1}^{-5;2}$$

$$= \left(\frac{-625}{4} + \frac{250}{3} + \frac{325}{2} + 50 - 4 - \frac{16}{3} + 26 - 20\right) - 2\left(\frac{-1}{4} - \frac{2}{3} + \frac{13}{2} - 10\right)$$

$$\cong 145.08$$

7) la sinusoïde, l'axe OX sur [0,4π]

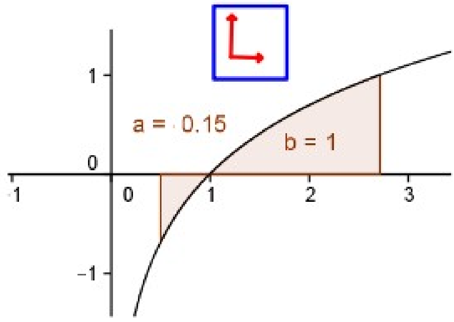


$$A = 8\int_0^{\pi/2} \sin x \, dx = [-8\cos x]_0^{\pi/2} = 8$$

ou

$$4\int_0^{\pi} \sin x \, dx = 4\cdot(-\cos x)]_0^{\pi} = 4 - (-4) = 8$$

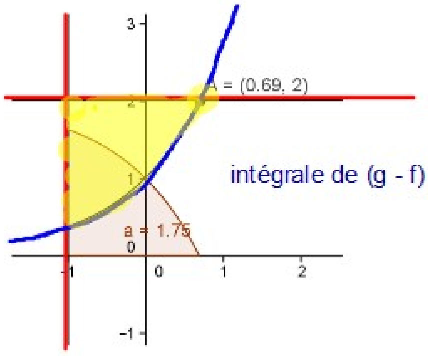
8) f(x) = ln x , OX et les droites x= 1/2 et x = e



$$A = -\int_{1/2}^{1} \ln x \, dx + \int_{1}^{e} \ln x \, dx$$

$$= [x\ln(x) - x]_{1;1}^{1/2;e} = \left(0.5\ln 0.5 - 0.5 + 0\right) - 2\left(0 - 1\right) \cong 1,15$$

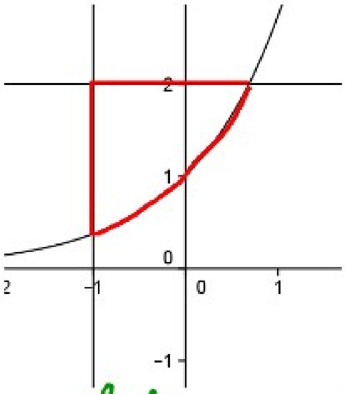
9) $f(x) = e^x$, $g(x) = 2$ et $d \equiv x = -1$



$f(x) - g(x) = 0$

$e^x - 2 = 0$

$x = \ln 2$



$f - g > 0$?

$e^x - 2 > 0$

$e^x > 2$

$x > \ln 2$

x	-1 $\quad$ $\ln 2$
$f - g$ ($e^x - 2$)	$-$ $\quad$ 0 $\quad$ $+$

$$\mathcal{A} = -\int_{-1}^{\ln 2} e^x - 2\, dx = \int_{-1}^{\ln 2} 2 - e^x\, dx$$

rem : ln 2 = 0,69

$$A = \int_{-1}^{\ln 2}\left(2 - e^x\right)dx = \left[2x - e^x\right]_{-1}^{\ln 2}$$

$$= \left(2\ln 2 - 2\right) - \left(-2 - \frac{1}{e}\right) = 1,75$$