Sujet B

Q1 $4^0+3^{-1}-3^2 = 1+\frac{1}{3}-9$

$= -8+\frac{1}{3} = \boxed{-\frac{23}{3}}$

Q2 $A = \frac{25^4 \times 5^3}{5^5}$

$A = \frac{(5^2)^4 \times 5^3}{5^5} = \frac{5^8 \times 5^3}{5^5}$

$= \frac{5^{11}}{5^5} = \boxed{5^6}$

Q3 $B = 5^{n+2} - 5^{n-1}$

$= 5^n(5^2 - 5^{-1})$

$= 5^n\left(25 - \frac{1}{5}\right)$

$= \boxed{5^n \times \frac{124}{5}}$

Q4 $C_n = -3 + \frac{4}{n} = \frac{-3n+4}{n}$

$\frac{1}{C_n} = \frac{n}{-3n+4}$

Q5 $U_0 = 6 \quad U_{n+1} = -2U_n$

1) (U_n) géométrique de raison -2

$U_n = U_0 \times q^n = \boxed{6 \times (-2)^n}$

2) $U_0 + U_1 + \dots + U_n = U_0 \times \frac{1-q^{n+1}}{1-q}$

$= 6 \times \frac{1-(-2)^{n+1}}{1+2}$

$= \frac{6}{3} \times \left(1-(-2)^{n+1}\right)$

$= \boxed{2\left(1-(-2)^{n+1}\right)}$

Sujet B

Q6

$9x^2 + x = 0$

$x(9x+1) = 0$

$x = 0$ ou $9x + 1 = 0$

$x = -\frac{1}{9}$

$\boxed{S = \left\{0 ; -\frac{1}{9}\right\}}$

Q7

$f(x) = 2\sqrt{x} + \frac{5}{x}$

$f'(x) = 2 \times \frac{1}{2\sqrt{x}} + 5 \times \frac{-1}{x^2} = \boxed{\frac{1}{\sqrt{x}} - \frac{5}{x^2}}$

Q8

$f(x) = -x^2 + 7x$

$f'(x) = -2x + 7$

$y = f'(-3)(x+3) + f(-3)$

$y = 13(x+3) - 30$

$\boxed{y = 13x + 9}$

$f(-3) = -(-3)^2 + 7(-3)$

$= -9 - 21$

$= -30$

$f'(x) = -2x + 7$

$f'(-3) = 6 + 7 = 13$

Q9

$f(x) = e^x(3x-1)$

$f'(x) = e^x(3x-1) + e^x(3)$

$f'(x) = e^x(3x+2)$

$\forall x \in \mathbb{R} \quad e^x > 0.$

$3x + 2 = 0$

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

$3x + 2 > 0$

$\iff 3x > -2$

$\iff x > -\frac{2}{3}$

x	$-\infty$		$-2/3$		$+\infty$
e^x		$+$		$+$	
$3x+2$		$-$	0	$+$	
$f'(x)$		$-$	0	$+$	
$f(x)$		$\searrow$		$\nearrow$	

Rmq :

$3x + 2 = ax + b$

avec $a = 3 > 0$

donc f^on affine croissante

donc signe $- \ 0 \ +$