5) The equation $\sqrt{3x+1}=\sqrt{x+4}+1$, has

A) Two solutions in $(-7,7)$

B) One solution in $(-7,1)$

C) Two solutions in $(-1,7)$

D) One solution in $(1,7)$

E) Two solutions in $(-1,7)$

$\sqrt{3x+1} = \sqrt{x+4} + 1$

Squaring

$3x+1 = (x+4) + 2\sqrt{x+4} + 1$

$3x+1-x-4-1 = 2\sqrt{x+4}$

$2x-4 = 2\sqrt{x+4} \quad \div 2$

$x-2 = \sqrt{x+4}$

$x^2-4x+4 = x+4$

$x^2-5x = 0$

$x(x-5)=0$

Check

$x=0$

$\sqrt{0+1} = \sqrt{0+4}+1$

$1 = 3$ false

$x=5$

$\sqrt{16} = \sqrt{9}+1$

$4 = 4$ True

$SS=\{5\}$

6) The solution set for $\frac{1}{x-1} \le \frac{2}{x+2}$ is

A) $[2,\infty)$

B) $(-\infty,-2)\cup[1,4)$

C) $(-\infty,-2]\cup[1,4]$

D) $(-2,1)\cup[4,\infty)$

E) $[-2,1]\cup[4,\infty)$

$\frac{1}{x-1} - \frac{2}{x+2} \le 0$

$\frac{x+2-2x+2}{(x-1)(x+2)} \le 0$

$\frac{-x+4}{(x-1)(x+2)} \le 0$

$\frac{x-4}{(x-1)(x+2)} \ge 0 \rightarrow \oplus$ or 0

x		-2		1		4	
$x-4$	$-$		$-$		$-$	0	$+$
$x-1$	$-$		$-$	0	$+$		$+$
$x+2$	$-$	0	$+$		$+$		$+$
	$-$	$\cup$	$+$	$\cup$	$-$	0	$+$

$SS=(-2,1)\cup[4,\infty)$

7) The set of values of k for which the equation $x^2+kx=-k$ has one or two real solutions in x is

A) $[0,4]$

B) $(-\infty,-4]\cup[0,\infty)$

C) $(-\infty,0]\cup[4,\infty)$

D) $(-\infty,0)\cup(0,\infty)$

E) $(0,4)$

$x^2+kx+k=0$

1 or 2 real sol^{n}s

$\Rightarrow \Delta \ge 0$

$k^2-4k \ge 0$

$k(k-4) \ge 0 \rightarrow \oplus$ or 0

		0		4	
k	$-$	0	$+$		$+$
$k-4$	$-$		$-$	0	$+$
	$+$	0	$-$	0	$+$

$k \in (-\infty,0]\cup[4,\infty)$