1) (A) $(216, 111)$ $216 = 1(111) + 105$

$(111, 105)$ $111 = 1(105) + 6$

$(105, 6)$ $105 = 17 \cdot 6 + 3$

$(6, 3)$ $6 = 2 \cdot 3$

$(3, 0) = \boxed{3}$

(B) $(1001, 11) = 1001 = (91) \cdot (11)$

$(11, 0) = \boxed{11}$

(C) $(5168, 663)$ $5168 = 7(663) + 527$

$(663, 527)$ $663 = 527 + 136$

$(527, 136)$ $527 = 3 \cdot 136 + 119$

$(136, 119)$ $136 = 119 + 17$

$(119, 17)$ $119 = 7 \cdot 17$

$(17, 0)$ $= \boxed{17}$

(D) $\gcd(2468, 1357) = 2468 = 1357 + 1111$

$(1357, 1111)$ $1357 = 1111 + 246$

$(1111, 246)$ $1111 = 4(246) + 127$

$(246, 127)$ $246 = 127 + 119$

$(127, 119)$ $127 = 119 + 8$

$(119, 8)$ $119 = 14(8) + 7$

$(8, 7)$ $8 = 7 + 1$

$(7, 1)$ $7 = 7 \cdot 1$

$(1, 0)$ $\boxed{1}$

(E) $\gcd(733103, 91637)$

$733103 = 8 \cdot 91637 + 7$

$(91637, 7) = (13091) \cdot 7 = 91637$

$\boxed{7}$

2) the possible values are 1 or p = the prime number itself

3) $\gcd(6123, 2913)$

$6123 = 2(2913) + 297$

$2913 = 9 \cdot 297 + 240$

$297 = 1 \cdot 240 + 57$

$240 = 4 \cdot 57 + 12$

$57 = 4 \cdot 12 + 9$

$12 = 1 \cdot 9 + 3$

$9 = 3 \cdot 3$

$(3, 0)$

$3 = 12 - 1 \cdot 9$

$3 = (240 - 4 \cdot 57) - 1(57 - 4 \cdot 12)$

$= 240 - 4 \cdot 57 - 1 \cdot 57 + 4 \cdot 12$

$= 240 - 4 \cdot 57 - 57 + 4 \cdot (240 - 4 \cdot 57)$

$= 5 \cdot 240 - 21 \cdot 57$

$= 5 \cdot (2913 - 9 \cdot 297) - 21(297 - 1 \cdot 240)$

$25 \cdot 2913 - 45 \cdot 297 - 21 \cdot 297 + 21 \cdot 240$

$+ 21 \cdot (2913 - 9 \cdot 297)$

$+ 21 \cdot 2913 - 189 \cdot 297$

$-66 \cdot (6173 - 2 \cdot 2913)$

$-66 \cdot 6173 + 132 \cdot 2913$

$159 \cdot 2913 - 66 \cdot 6173 - 189 \cdot 297$

$-189 \cdot (6173 - 2 \cdot 2913)$

$-66 \cdot 6173 \quad -189 \cdot 6173 + 378 \cdot 2913$

$3 = 536 \cdot 2913 - 255 \cdot 6173$

4) the gcd is going to be either 1, 2, 4, 8 as s and t must be whole integers and can not be fractions

5) $2141 = 1351 + 790$

$1351 = 790 + 561$

$790 = 561 + 329$

$561 = 329 + 162$

$329 = 162 + 147$

$162 = 147 + 35$

$147 = 4 \cdot 35 + 7$

$35 = 5 \cdot 7$

$(7,0) = \boxed{7}$

6) $\gcd(n, n+1)$

$\gcd(4,5) = 1$

each gcd will be 1 as they are so close