$$\frac{3+i}{1-i}$$

$$= \frac{3+i}{1-i} \times \frac{1+i}{1+i}$$

$$= \frac{(3+i)(1+i)}{(1)^2 - (i)^2}$$

$$= \frac{3+4i+i^2}{1-i^2}$$

$$= \frac{3+4i+(-1)}{1-(-1)} \quad \because i^2 = -1$$

$$= \frac{3+4i-1}{1+1}$$

$$= \frac{2+4i}{2}$$

$$= \frac{2(1+2i)}{2}$$

$$= 1+2i$$

$3+i = (1+2i)(1-i)$

$3+i = 3+i$ Remainder 0

so GCD is $1-i$

Sometime its $1+i$