$$2x + 4y = 3$$
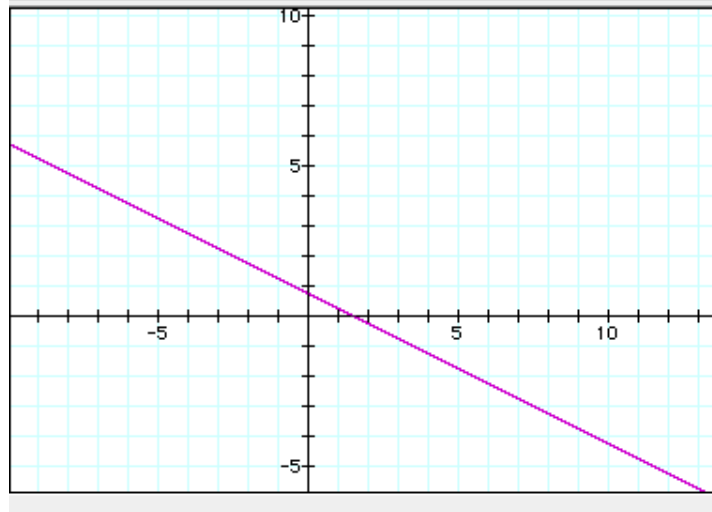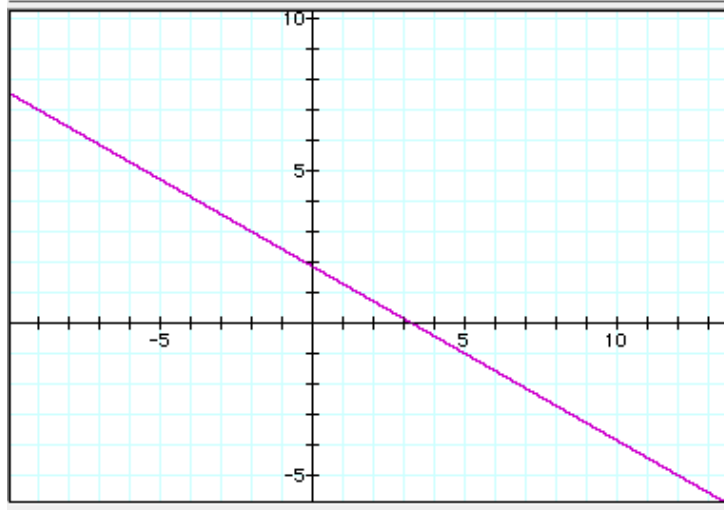

gcd(2,4) =2 which does not divide 3. No integer solutions.

$$4x + 7y = 13$$
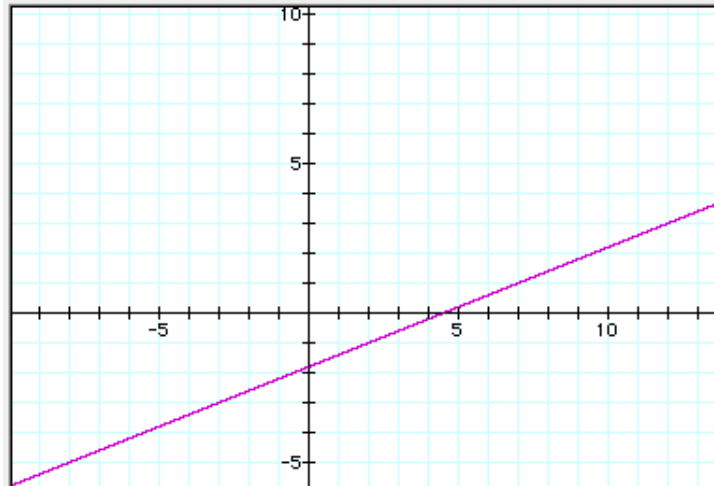

gcd(4,7)=1 which must divide any number including 13.
1 = 2.4-1.7, so 13=26.4-13.7 gives a particular solution.
The general solution is x=26-7t, y=-13+4t. E.g. (5,-1) for t=4, (12,-5) t=3 etc.

$6x - 15y = 27$

gcd(6,15)=3 which divides 27. Using the Euclidean algorithm 3=(-2).6+1.15,
so 27=(-18).6+9.15=(-18).6-(-9).(15) .
The general solution is x=-18-t15/3=-18-5t and y=-9+t6/3=-9+2t.
E.g. (7,1) t=-5 and (2,-1) t=-4.