Linear Programming – Worksheet 1
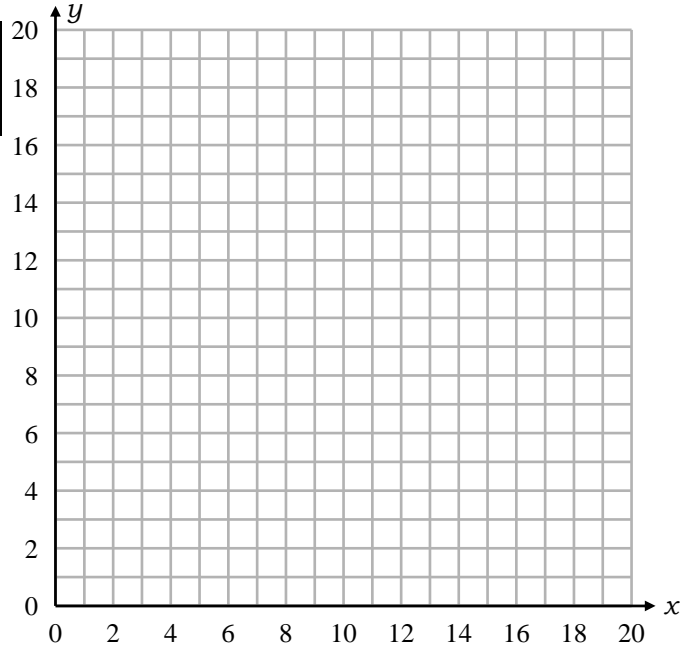
① Betty works a maximum of 20 hours per week programming computers and tutoring English. She receives $15 per hour for programming and $10 per hour for tutoring. She wishes to work between 3 and 8 hours per week on programming, but always to give more time to tutoring. To maximize the amount she earns, how many hours should she work on each job?

|			
$x =$			
$y =$			

② A carpenter makes bookcases in two sizes, large and small. It takes 6 hours to make a large bookcase and 2 hours to make a small one. The profit on a large bookcase is $50 and the profit on a small bookcase is $20. The carpenter can spend only 24 hours per week making bookcases and must make at least two of each size each week. How many of each size must be made per week in order to maximize profit?

$x =$			
$y =$			
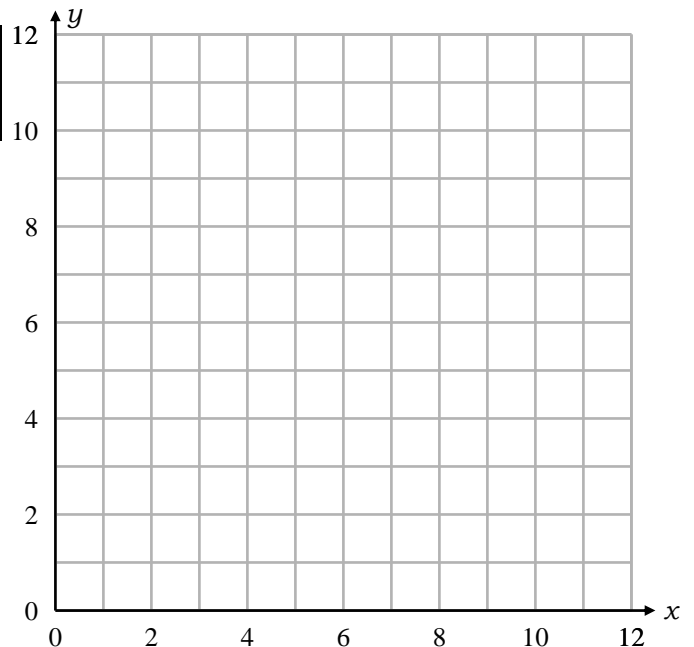
③ A tire manufacturer has 1000 units of raw rubber to use in producing radial tires for passenger cars and tractor tires. Each radial tire requires 5 units of rubber; each tractor tire requires 20 units. Labor costs are $8 for a radial tire and $12 for a tractor tire. Suppose that a manufacturer does not wish to pay more than $1500 in labor costs and wishes to make a profit of $10 per radial tire and $25 per tractor tire. How many of each kind of tire should be made in order to maximize profit?

$x =$			
$y =$			
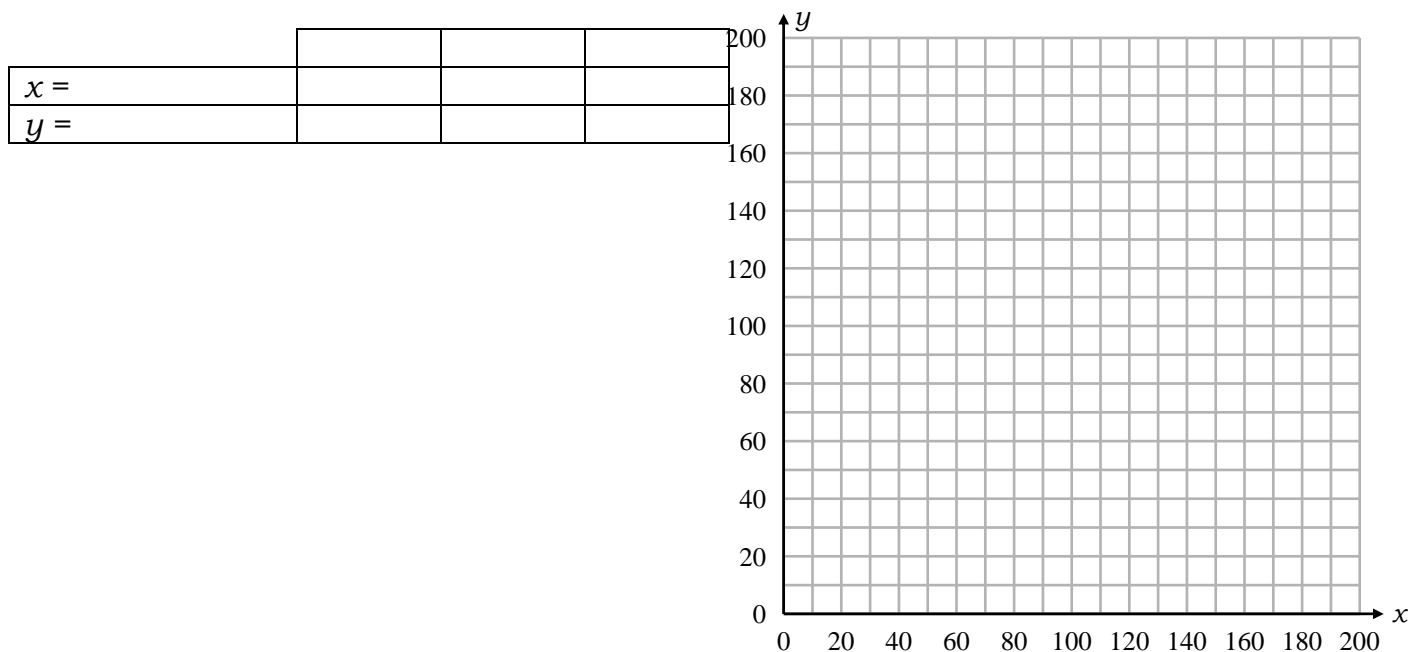
④ Janet Swifteagle wants to purchase at least 20 minutes of computer time from a time-sharing computer company. She needs at least 7 minutes of time from Computer A. The time-sharing company will rent Computer A only if the user agrees also to rent Computer B for at least 5 minutes. The rent for Computer A is $500 per minute and the rent for Computer B is $200 per minute. In order to minimize the total cost, how much computer time should Janet buy on each machine?

$x =$			
$y =$			