Therefore, the manufacturer should produce 320 units of A and 300 units of B to maximize the number of units produced subject to the constraints.

13. Find the inverse of the matrix A = [3 2; 1 4]:
The inverse of a 2x2 matrix A = [a b; c d] is given by (1/det(A)) * [d -b; -c a], where det(A) is the determinant of A.
So, for A = [3 2; 1 4], we have det(A) = (34) - (21) = 10.
Therefore, the inverse of A is (1/10) * [4 -2; -1 3].

14. If sin(x+20) = cos(x-10), find the value of x:
Using the identity sin(a+b) = sin(a)cos(b) + cos(a)sin(b), we can rewrite the given equation as sin(x)cos(20) + cos(x)sin(20) = cos(x)cos(10) + sin(x)sin(10).
Simplifying this, we get tan(x) = (cos(10) - cos(20)) / sin(20) = -0.9619 (approx).
Using a calculator or trigonometric tables, we find that the angle whose tangent is -0.9619 is approximately -42.3 degrees (or -0.738 radians).
Therefore, x = -20 - 0.738 = -20.738 degrees (or -0.362 radians).

15. If the sum of the first n terms of an arithmetic progression is 5n^2 - 3n, find the 10th term:
The sum of the first n terms of an arithmetic progression is given by the formula Sn = n/2[2a + (n-1)d], where a is the first term and d is the common difference.
From the given information, we have S10 = 5(10)^2 - 3(10) = 470, and S9 = 5(9)^2 - 3(9) = 378.
Subtracting S9 from S10, we get the 10th term (which is the difference between the sums of the first 10 terms and the first 9 terms):
T10 = S10 - S9 = (10/2)[2a + (10-1)d] - (9/2)[2a + (9-1)d]
Simplifying this, we get T10 = 92 - 6d.
We still need to find the values of a and d to determine T10. Using the formula for S9 and S10, we can set up two equations in two variables:
S9 = 9/2[2a + (9-1)d] = 5(9)^2 - 3(9)
S10 = 10/2[2a + (10-1)d] = 5(10)^2 - 3(10)
Simplifying these equations, we get:
9a + 36d = 360
10a + 45d = 515
Solving for a and d, we get a = 5 and d = 4.
Substituting these values into the expression we obtained for T10, we get:
T10 = 92 - 6(4) = 68.
Therefore, the 10th term of the arithmetic progression is 68.

16. Let the side of the square park be "a". Then, its area is a^2 = 144 sq. meters, so a = 12 meters.
Let the width of the path be "x". Then, the side of the new square formed by the outer edge of the path is (a + 2x) meters. The area of the path is then:
Area of path = (a + 2x)^2 - a^2
Since the area of the path is equal to the area of the park, we have:
(a + 2x)^2 - a^2 = 144
Expanding the left side of the equation, we get:
4ax + 4x^2 = 144