

Determine an exact expression for the floating point operations (flops – multiply/divide) count of the algorithms below and verify the following asymptotic values:

- Elimination phase : $\approx n^3/3$ flops
- Back substitution phase : $\approx n^2/2$ flops

for large n .

```
% Elimination Phase
for k = 1 : n - 1 % Pivot row index
    for i = k + 1 : n % Row index
        factor = a(i,k) / a(k,k) ; % Pivot element a(k,k)
        for j = k + 1 : n % Column index
            a(i,j) = a(i,j) - factor * a(k,j) ;
        end
        b(i) = b(i) - factor * b(k) ;
    end
end
end
```

```
% Back substitution phase
x(n) = b(n) / a(n,n) ;
for i = n - 1 : -1 : 1
    sum = 0 ;
    for j = i + 1 : n
        sum = sum + a(i,j) * x(j) ;
    end
    x(i) = ( b(i) - sum ) / a(i,i) ;
end
```