Date of Assignment: 27.01.2025
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Assignment 4

Question

If $f = x^2 + y^2 + z^2$ and $F = xy\,\hat{i} + yz\,\hat{j} + zx\,\hat{k}$, then find grad(f), div(F) and curl(F)

Code

```
syms x y z;
f = x.^2 + y.^2 + z.^2;
F = [x*y, y*z, z*x];
disp('Scalar Function f = ');
disp(f);
disp('Vector Function F = ');
disp(F);
grad_f = gradient(f,[x,y,z]);
disp('grad(f) at (x,y,z) = ');
disp(grad_f);
div_F = divergence(F,[x,y,z]);
disp('div(F) at (x,y,z) = ');
disp(div_F);
curl_F = curl(F,[x,y,z]);
disp('curl(F) at (x,y,z) = ')
disp(curl_F);
```

Output

```
>> Assignment_4
Scalar Function f =
x^2 + y^2 + z^2

Vector Function F =
[x*y, y*z, x*z]

grad(f) at (x,y,z) =
2*x
2*y
2*z

div(F) at (x,y,z) =
x + y + z
```

```
curl(F) at (x,y,z) =
-y
-z
-x

>>
```