In[109]:=
```
(* 3D vector field *)
F = {2 x + 3 y + 4 z, x^2 + y^2 + z^2, x^3 + y^3 + z^3}
(* sphere around (x,y,z) with radius r *)
q = {x + r Sin[ph] Cos[th], y + r Sin[ph] Sin[th], z + r Cos[ph]};
volume = 4 Pi r^3 / 3;
```

Out[109]= $\left\{2 x + 3 y + 4 z,\ x^2 + y^2 + z^2,\ x^3 + y^3 + z^3\right\}$

In[124]:=
```
(* flux density *)
qth = D[q, th];
qph = D[q, ph];
n = Simplify[Cross[qph, qth]]
Foq = Simplify[F /. {x → q[[1]], y → q[[2]], z → q[[3]]}];
flux = Integrate[Integrate[Dot[Foq, n], {th, 0, 2 Pi}], {ph, 0, Pi}]
Limit[flux / volume, r → 0]
```

Out[126]= $\left\{r^2 \text{Cos}[\text{th}]\ \text{Sin}[\text{ph}]^2,\ r^2\ \text{Sin}[\text{ph}]^2\ \text{Sin}[\text{th}],\ r^2\ \text{Cos}[\text{ph}]\ \text{Sin}[\text{ph}]\right\}$

Out[128]= $\frac{4}{15}\pi\, r^3\ \left(3\, r^2 + 5\ \left(2 + 2\, y + 3\, z^2\right)\right)$

Out[129]= $2 + 2\, y + 3\, z^2$

In[93]:=
```
Div[F, {x, y, z}]
```

Out[93]= $2 + 2\, y + 3\, z^2$