

find the divergence A at point(2,1,-2) when $A = (x^2y^2z)*i + (x^3y^3z^2)*j + (xyz^2)*k$?

main formula is :

$$A = U*i + V*j + W*k$$

$$\text{div}(A) = dU/dx + dV/dy + dW/dz$$

paste in our task:

$$A = (x^2y^2z)*i + (x^3y^3z^2)*j + (xyz^2)*k$$

$$A = U*i + V*j + W*k$$

$$U = x^2y^2z$$

$$V = x^3y^3z^2$$

$$W = xyz^2$$

$$\text{div}(A) = dU/dx + dV/dy + dW/dz = d(x^2y^2z)/dx + d(x^3y^3z^2)/dy + d(xyz^2)/dz = 2xy^2z + 3x^3y^2z^2 + 2xyz =$$

=/ (we must calculate divergence at the point (2,1,-2), it is mean that x=2, y=1, z= -2)/=

$$= 2*2*1^2*(-2) + 3*2^3*1^2*(-2)^2 + 2*2*1*(-2) = -8+96-8=80$$

Answer:

$$\text{div}(a)=80.$$