Distance from a Pt to a Plane

The distance between a pt (x_1, y_1, z_1) and a plane

$$ax + by + cz + d = 0$$

is

$$D = \frac{|ax_1 + by_1 + cz_1 + d|}{\sqrt{a^2 + b^2 + c^2}}$$

Ex. Find the distance between the pt $(5, -2, 3)$ and the plane

$$6x + 8y - z + 4 = 0$$

Here,

$$x_1 = 5, \quad y_1 = -2, \quad z_1 = 3$$
$$a = 6, \quad b = 8, \quad c = -1$$

So $a^2 + b^2 + c^2 = 36 + 64 + 1 = 101$

$$ax_1 + by_1 + cz_1 + d$$
$$= 30 - 16 - 3 + 4 = 15$$

so

$$D = \frac{15}{\sqrt{101}}$$