DISTANCE POINT-POINT (3D). If $P$ and $Q$ are two points, then 
$$d(P, Q) = |\vec{PQ}|$$ 
is the distance between $P$ and $Q$.

DISTANCE POINT-PLANE (3D). If $P$ is a point in space and $\Sigma : \vec{n} \cdot \vec{x} = d$ is a plane containing a point $Q$, then 
$$d(P, \Sigma) = \frac{|(\vec{PQ}) \cdot \vec{n}|}{|\vec{n}|}$$ 
is the distance between $P$ and the plane.

DISTANCE POINT-LINE (3D). If $P$ is a point in space and $L$ is the line $\vec{r}(t) = Q + t\vec{u}$, then 
$$d(P, L) = \frac{|(\vec{PQ}) \times \vec{u}|}{|\vec{u}|}$$ 
is the distance between $P$ and the line $L$.

DISTANCE LINE-LINE (3D). $L$ is the line $\vec{r}(t) = Q + t\vec{u}$ and $M$ is the line $\vec{s}(t) = P + t\vec{v}$, then 
$$d(L, M) = \frac{|(\vec{PQ}) \cdot (\vec{u} \times \vec{v})|}{|\vec{u} \times \vec{v}|}$$ 
is the distance between the two lines $L$ and $M$.

DISTANCE PLANE-PLANE (3D). If $\vec{n} \cdot \vec{x} = d$ and $\vec{n} \cdot \vec{x} = e$ are two parallel planes, then their distance is $(e - d)/|\vec{n}|$. Nonparallel planes have distance 0.

EXAMPLES

DISTANCE POINT-POINT (3D). $P = (-5, 2, 4)$ and $Q = (-2, 2, 0)$ are two points, then 
$$d(P, Q) = |\vec{PQ}| = \sqrt{(-5 + 2)^2 + (2 - 2)^2 + (0 - 4)^2} = 5$$

DISTANCE POINT-PLANE (3D). $P = (7, 1, 4)$ is a point and $\Sigma : 2x + 4y + 5z = 9$ is a plane which contains the point $Q = (0, 1, 1)$. Then 
$$d(P, \Sigma) = \frac{|(-7, 0, -3) \cdot (2, 4, 5)|}{|\sqrt{45}|} = \frac{29}{\sqrt{45}}$$
is the distance between $P$ and $\Sigma$.

DISTANCE POINT-LINE (3D). $P = (2, 3, 1)$ is a point in space and $L$ is the line $\vec{r}(t) = (1, 1, 2) + t(5, 1, 2)$. Then 
$$d(P, L) = \frac{|(-1, -2, 1) \times (5, 0, 1)|}{\sqrt{26}} = \frac{|(-2, 6, 10)|}{\sqrt{26}} = \frac{\sqrt{140}}{\sqrt{26}}$$
is the distance between $P$ and $L$.

DISTANCE LINE-LINE (3D). $L$ is the line $\vec{r}(t) = (2, 1, 4) + t(-1, 1, 0)$ and $M$ is the line $\vec{s}(t) = (-1, 0, 2) + t(5, 1, 2)$. The cross product of $(-1, 1, 0)$ and $(5, 1, 2)$ is $(2, 2, -6)$. The distance between these two lines is 
$$d(L, M) = |(3, 1, 2) \cdot (2, 2, -6)|/\sqrt{44} = \frac{4}{\sqrt{44}}$$.

DISTANCE PLANE-PLANE (3D). $5x + 4y + 3z = 8$ and $5x + 4y + 3z = 1$ are two parallel planes. Their distance is $7/\sqrt{50}$. 

DISTANCE PLANE-PLANE (3D). $x + y + z = 7$ and $x + y + z = 11$ are two parallel planes. Their distance is $4/\sqrt{3}$. 