

# 英王画板

## inRm3D Sketchpad

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这是一个三维仿真的几何学教学工具。凡能用几何语言或几何方程表达式描述的三维几何形体，都能方便的制作、编辑和演示。三维场景中的几何形体就象悬浮在空中的实物模型，可随意调整视点和景深。

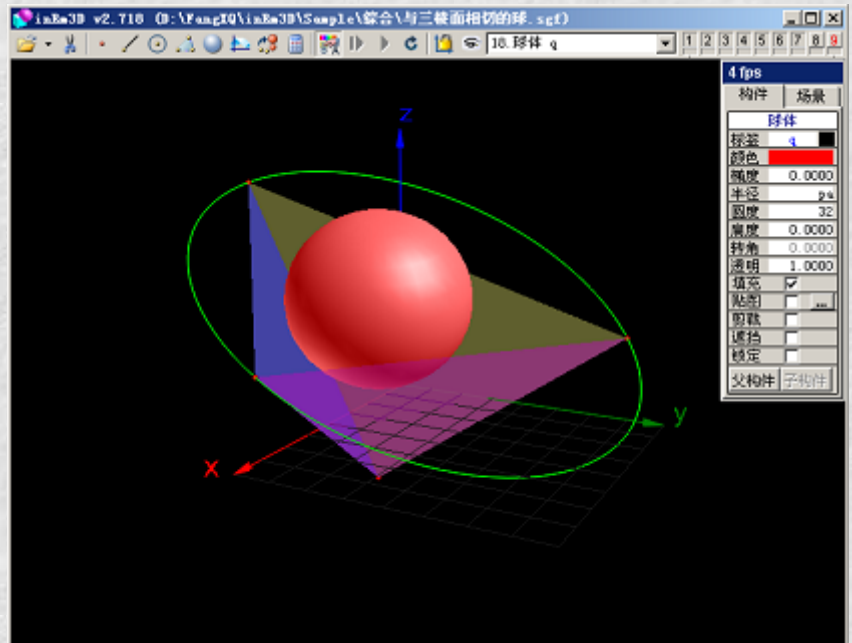
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This is a 3D geometry classroom teaching tool. With the inRm3D, 3D geometric model of geometric language describing can be easily created, edited and displayed.

In the inRm3D, the 3D geometric model of the scene as suspended in the air in kind, is free to a different point of view, depth of field and perspective observation.



### 作图功能简述

#### Drawing Function Description

##### 点

##### Points

	自由点 Free Point	三维坐标系中任意位置的点。	The point at any position in 3D scene.
	约束点 Bound Point	受另一个几何构件（直线、圆、圆弧、平面、球面、轨迹线、曲线等）约束的点	The point bound by another component (line, circle, arc, plane, ball, edge of the polyhedron, locus, curve, etc.).
	交点 Intersection Point	两个线状构件（直线、圆、圆弧、轨迹线、相贯线、曲线、路径等）的交点，线状构件与面状构件（平面、三维实体、曲面等）的交点	The intersection point of two linear components (line, circle, arc, locus, curves, intersection lines, paths, etc.), linear and planar intersection (plane, solid, surface, etc.).
	中点 Midpoint	两个构件（点、直线、平面等）间距之中点	The midpoint between two components (point, line, plane, etc.).

##### 直线








##### Straight Lines

	点向线 Vector	以一个点状构件和两个方向角定义的直线	The vector line defined by the origin and tow angles.
	两点线 Segment	以两个点状构件定义的直线	The segment defined by two points.
	平行线 Parallel Line	与给定直线平行的直线	The vector line parallel to a given line.
	垂线 / 切线 Vertical/Tangent Line	与给定直线或平面垂直的直线 两直线的公垂线 与圆、轨迹线、函数曲线、圆锥曲线等的切线 两圆的公切线	The vector line vertical to a given line or plane.
	中线	两直线、或直线与平面的角平分线	The bisector line defined by two lines, or by a

	<b>Bisector</b>	line and a plane.
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## 曲线

### Curves

	点法圆 <b>Normal Circle</b>	由圆心和法线定义的圆	The circle defined by the origin and a normal line.
	三点圆 <b>3-Dot Circle</b>	由任意三点定义的圆	The circle defined by three points.
	点法弧 <b>Normal Arc</b>	绕任意直线的圆弧	The arc defined by the origin and a normal line.
	三点弧 <b>3-Dot Arc</b>	由任意三点定义的圆弧	The arc defined by three points.
	相贯线 <b>Intersection Line</b>	两个面状构件之交线	The intersection line defined by two components of surface shape.
	轨迹线 <b>Locus</b>	点状构件随其它构件移动而形成的轨迹	The Locus of a point following the movement of the other components.
	曲线 <b>Curve</b>	由几何方程、参数方程、隐函数方程描述的曲线； 由任意三点定义的圆锥曲线（抛物线、椭圆、双曲线）	The function curves defined by geometric equation, and conics curves defined by three points.
	路径 <b>Path</b>	由空间任意点和线状构件连接而成的曲线	The path defined by a series of points, lines and curves.





## 平面

### Planes

	点线面 <b>Dot-Line Plane</b>	过一点和一条直线的平面	The plane defined by a point and a line.
	三点面 <b>3-point Plane</b>	过空间任意三点的平面	The plane defined by three points.
	平行面 <b>Parallel Plane</b>	与已知平面平行的面	The plane parallel another plane through the origin.
	垂面 <b>Perpendicular Plane</b>	与已知直线或平面垂直的平面； 两平面的公垂面	The plane perpendicular to another line or plane through the origin.
	中面 <b>Bisector Plane</b>	两个构件（点、线、平面）之间的平分面	The bisector plane defined by two lines, or a line and a plane, or two planes.
	多边形 <b>Polygon</b>	正多边形 任意凸多边形	The polygon defined by some of given points.





## 曲面

### Surfaces

	函数曲面 <b>Equation Surface</b>	由几何方程、参数方程、隐函数方程描述的曲面	The curve surface drawing by equation function.
	旋转曲面 <b>Revolved Surface</b>	线状构件环绕轴线而形成的曲面	The curve surface generate by linear component revolve the axis.
	直纹曲面 <b>Ruled Surface</b>	用直线均匀滑过两条曲线而形成的曲面	A linear component glide on two curves to construct the surface.
	轨迹面 <b>Trace Surface</b>	线状构件（直线、圆、圆弧、轨迹线、相贯线、曲线、路径等）随其他构件位移而形成的曲面	The locus of linear component movement follow the other components.









## 实体

### Solids

	球 <b>Sphere</b>	以球心和中轴线定义的球（椭球）	The sphere defined by center point and the normal component.
	圆台 <b>Cone</b>	以下底圆心和中轴线定义的圆台	The cone defined by bottom center and the normal component.
	棱台 <b>Pyramid</b>	以正多边形为下底的棱台； 以任意凸多边形为下底的棱台	The pyramid defined by bottom center and the normal component.
	多面体 <b>Regular Polyhedron</b>	以外接球心和中轴线定义的正多面体； 长方体； 任意凸多面体	The regular polyhedron defined by center point and the normal component.







## 变换

### Traslates

	位移变换 <b>Displacement</b>	源构件位移后的映像	The copy component of the source component defined by 3D relative displacement.
	投影变换 <b>Projection</b>	源构件在直线或平面上的投影	The projection of the source component.
	对称变换 <b>Reflection</b>	源构件对称于镜像构件的映像	The Symmetrical component of the source component.
	旋转变换 <b>Rotation</b>	源构件围绕轴线旋转后的映像	The copy component of the source component rotation the axis.
	缩放变换 <b>Dilation</b>	源构件相对于缩放点的缩放映像	The dilated component of the source component.
	向量变换 <b>Translation</b>	源构件按指定矢量位移的映像	The copy component with the source component along the vector.
	反演变换 <b>Inversion</b>	由反演中心和反演率定义的反演映象	Defined by a center point of the inversion and a inversion ratio.
	迭代 <b>Iteration</b>	将可见构件序列按一定的迭代规则反复变换后的映像	Copy the components repeatedly according to a certain transformation rules.

## 其它

### Others

	计算器 <b>Calculator</b>	显示计算值。支持十一个一元计算函数、七个二元逻辑函数、九个三角函数	Support eleven unary calculate functions, seven binary logic functions, and nine trigonometric functions.
	参数 <b>Parameter</b>	在指定位置显示常量参数	Show the const parameter.
	度量 <b>Measure</b>	在指定位置显示度量值。度量并显示构件的长度、面积、体积、斜率、坐标，及相互间的距离、角度、比值等	Measure and show some properties of the selected component. You can measure numeric properties, also measure analytic properties.
	文本 <b>Text</b>	在指定位置显示文本	Show the text.
	图像 <b>Image</b>	在指定位置显示图片	Show a image.
	标记 <b>Marker</b>	标记线状构件或角度	Mark the linear components or their angle.

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