

Light Source

In[191]:= **Light** = {0, 0, 3};

Vertices

In[192]:= **A1** = {1, 1, 1};
A2 = {1, 1, -1};
A3 = {1, -1, 1};
A4 = {1, -1, -1};
A5 = {-1, 1, 1};
A6 = {-1, 1, -1};
A7 = {-1, -1, 1};
A8 = {-1, -1, -1};

In[200]:=

Shadows of vertices on the 2d plane

In[201]:= **B1** = **Light** + (**Light** - **A1**) (-6) / (3 - **A1**[[3]]);
B2 = **Light** + (**Light** - **A2**) (-6) / (3 - **A2**[[3]]);
B3 = **Light** + (**Light** - **A3**) (-6) / (3 - **A3**[[3]]);
B4 = **Light** + (**Light** - **A4**) (-6) / (3 - **A4**[[3]]);
B5 = **Light** + (**Light** - **A5**) (-6) / (3 - **A5**[[3]]);
B6 = **Light** + (**Light** - **A6**) (-6) / (3 - **A6**[[3]]);
B7 = **Light** + (**Light** - **A7**) (-6) / (3 - **A7**[[3]]);
B8 = **Light** + (**Light** - **A8**) (-6) / (3 - **A8**[[3]]);

Shadow edges

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In[209]:= L2 = {Red, Line[{B1, B5}]};
          L3 = {Red, Line[{B1, B3}]};
          L4 = {Red, Line[{B1, B2}]};
          L6 = {Red, Line[{B2, B6}]};
          L7 = {Red, Line[{B2, B4}]};
          L9 = {Red, Line[{B3, B7}]};
          L10 = {Red, Line[{B3, B4}]};
          L12 = {Red, Line[{B4, B8}]};
          L14 = {Red, Line[{B5, B7}]};
          L15 = {Red, Line[{B5, B6}]};
          L17 = {Red, Line[{B6, B8}]};
          L19 = {Red, Line[{B7, B8}]};

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Light rays

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In[221]:= M1 = Line[{Light, B1}];
          M2 = Line[{Light, B2}];
          M3 = Line[{Light, B3}];
          M4 = Line[{Light, B4}];
          M5 = Line[{Light, B5}];
          M6 = Line[{Light, B6}];
          M7 = Line[{Light, B7}];
          M8 = Line[{Light, B8}];

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3D Cube edges

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In[301]:= K2 = {Blue, Line[{A1, A5}]};
K3 = {Blue, Line[{A1, A3}]};
K4 = {Blue, Line[{A1, A2}]};
K6 = {Blue, Line[{A2, A6}]};
K7 = {Blue, Line[{A2, A4}]};
K9 = {Blue, Line[{A3, A7}]};
K10 = {Blue, Line[{A3, A4}]};
K12 = {Blue, Line[{A4, A8}]};
K14 = {Blue, Line[{A5, A7}]};
K15 = {Blue, Line[{A5, A6}]};
K17 = {Blue, Line[{A6, A8}]};
K19 = {Blue, Line[{A7, A8}]};

Poly = Polygon[{{5, 5, -3}, {5, -5, -3}, {-5, -5, -3}, {-5, 5, -3}}];

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Display graphics

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In[314]:= Graphics3D[{Thick, {Yellow, Sphere[Light, 0.15]}},
  K2, K3, K4, K6, K7, K9, K10, K12, K14, K15, K17, K19, M1, M2, M3, M4, M5,
  M6, M7, M8, L2, L3, L4, L6, L7, L9, L10, L12, L14, L15, L17, L19, Poly
}, ImageSize → 700, Boxed → False]

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Out[314]=

