Sculpture Drawing: Form and Viewpoint Study

Original tasks 1, 2, 3 / complete keys

Task 1

A sculpture feature is x = 15 units from the left in the front view, y = 5 units from the front in the side view, and z = 30 units high. Use u = x + 0.5y and v = z + 0.5y to find its oblique coordinates.

Answer: u = 15 + 2.5 = 17.5 and v = 30 + 2.5 = 32.5, so plot the feature at (17.5, 32.5).

Reason: The projection adds half the depth coordinate to both the horizontal and vertical front-view coordinates.

Check: Compute 0.5 × 5 = 2.5, then add 2.5 to x and z. Substituting the result back into the formula returns 17.5 and 32.5.

Task 2

An edge runs from A = (x 20, y 0, z 10) to B = (x 20, y 16, z 10). Under u = x + 0.5y and v = z + 0.5y, find both projected endpoints and describe the edge direction.

Answer: A projects to (20, 10). B projects to (28, 18). The edge moves 8 units right and 8 units up.

Reason: Only depth changes: y increases by 16, so each projected coordinate changes by half of 16, or 8 units.

Check: Substitute each endpoint separately. Confirm the two projected differences are both 8 and that the line uses the same up-right depth direction.

Task 3

In the stated oblique view, a sculpture has front, right-side, and top planes. Name which faces the viewer can see, and name the opposite faces that should be hidden in this chosen high, rightward view.

Answer: The front, right-side, and top planes are visible. The back, left-side, and bottom planes are hidden.

Reason: The chosen view looks from in front, above, and to the right, so those three adjoining planes face the viewer. This is a stated viewpoint convention.

Check: Label the three visible planes before shading. Check that no back, left-side, or bottom plane is drawn through the solid.

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Original tasks 4 / complete keys

Task 4

Compare two drawings that share a 40-by-40-unit front face. In the oblique version, use a 20-unit depth and the lesson rule so depth adds (10,10) to each front corner. In the one-point version, use horizon v=20 and vanishing point (60,20); choose the rear corners halfway from their matching front corners to that point. This halfway placement is a visual-depth convention, not a metric match to the oblique version. Give the four rear-corner coordinates in both versions.

Answer: Label the front corners A=(0,0), B=(40,0), C=(40,40), and D=(0,40). In the oblique version, add (10,10) to each: A′=(10,10), B′=(50,10), C′=(50,50), D′=(10,50). For one-point perspective, take each midpoint between its front corner and VP=(60,20): A′=(30,10), B′=(50,10), C′=(50,30), D′=(30,30). Connect each front corner to its corresponding rear point, then join the rear points in order.

Reason: The oblique rule adds the same vector (10,10), so its four depth edges remain parallel. The one-point construction uses the same vanishing point for all receding edges; taking the midpoint on each ray gives the stated rear corners.

Check: Recalculate each oblique point by adding (10,10). For the one-point version, verify that the line through each front corner and its rear point also passes through (60,20), and that all four use that same vanishing point on the horizon v=20.

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Source rubric / reflection

- [ ] Front and side dimensions are recorded at one scale.
- [ ] Feature x, y, and z coordinates are identified from the correct views.
- [ ] The stated projection rule is applied consistently.
- [ ] Depth edges use one direction and scale.
- [ ] Visible planes and hidden planes agree with the stated viewpoint.
- [ ] Shading follows a stated light convention.
- [ ] One-point comparison uses one vanishing point on the horizon and aims all receding depth edges at that point.

Reflection: What did you check, what did you change, and what will you try next?