Name _____

Solid Geometry Observation Worksheet

Date _____

01

Sketch or state the relationship before calculating. Return to the interactive model when you need another view.

1. State V, E and F for a hexagonal prism and verify Euler's relation.

2. A right cylinder has radius 1 and height 3. Find its volume and total surface area.

3. Why is a connected arrangement of six squares not always a cube net? Draw a non-example.

4. On the lateral surface of a cylinder of radius 1 and height 2, find the shortest path between opposite bottom/top points separated by half a turn.

5. Two side-by-side stacks have heights 1 and 3. How many top-view cells are occupied, and how tall is the highest front-view column?

6. A horizontal square has area 16. Under our half-depth, 45° oblique convention, find its image area.

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7. A cube of edge 2 has a central regular hexagonal section. Find its side count and area.

8. Does translating a cutting plane without rotating it always preserve the section's side count? Give an example.

9. Find the acute angle between directions (1,1,0) and (0,1,1).

10. Find the angle between direction (1,1,1) and the plane z=0.

11. Find the distance from (1,2,3) to z=0.

12. Why does translating the coordinate origin preserve a displacement vector? Explain using subtraction.

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13. Find the circumradius of a 2×3×6 cuboid.

14. Find the circumradius and inradius of a regular tetrahedron of edge 2.

15. When does a right cylinder of base radius 2 have an insphere tangent to every surface?

16. A right cone has base radius 3, height 4 and slant height 5. Find its inradius.

17. A regular tetrahedron’s edge doubles. By what factors do its height, area and volume change?

18. What is the angle between opposite tetrahedron edges, and the circumradius:midsphere:inradius ratio?