# Draw a Lamppost in Perspective: Base Ellipse and Cast Shadow

Original tasks 1, 2, 3 / complete keys

Task 1

A base center is 4 cm below the horizon. The post is 8 cm tall. The sun arrow points down-left. Using a shadow length equal to 1.5 times the post height, state the shadow direction and tip distance from the base center.

Answer: Shadow points up-right; tip is 12 cm from the base center along the up-right direction.

Reason: Opposite the down-left arrow is up-right. 1.5 times 8 cm equals 12 cm.

Check: Confirm the direction is exactly opposite the arrow and multiply 8 by 1.5 to verify 12 cm.

Task 2

An ellipse has a major axis of 6 cm. Using the lesson's hypothetical one-third ratio for the minor axis, what is the minor axis length, and which axis is horizontal?

Answer: Minor axis is 2 cm; the major axis is horizontal.

Reason: One-third of 6 cm is 2 cm. The convention places the major axis horizontally through the base center.

Check: Divide 6 by 3 to get 2, and confirm the longer axis is drawn horizontally.

Task 3

A post is drawn 9 cm tall with its base 5 cm below the horizon. The shadow tip is marked 18 cm from the base center. What shadow-length ratio was used, and is the shadow direction toward or opposite the sun arrow?

Answer: Ratio is 2 to 1; the shadow is opposite the sun arrow.

Reason: 18 divided by 9 equals 2. Cast shadows extend opposite the light direction.

Check: Divide the tip distance by post height to get 2, and verify the shadow line points away from the arrow.

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Original tasks 4 / complete keys

Task 4

A student draws a post with sides leaning toward the vanishing point and a shadow pointing toward the sun arrow. Name the two errors and give one fix for each.

Answer: Error one: tilted post; fix by keeping verticals vertical. Error two: shadow toward the sun; fix by reversing it to point opposite the arrow.

Reason: In one-point perspective verticals stay vertical, and shadows fall away from the light source.

Check: Use a straight edge to confirm verticality and compare the shadow line with the arrow to confirm opposite direction.

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## Source rubric / reflection

- [ ] Post sides are vertical and parallel within a small tolerance.
- [ ] Base ellipse has a horizontal major axis and a shorter vertical minor axis.
- [ ] Ellipse is symmetric about the base center and touches the ground at its lowest point.
- [ ] Shadow points opposite the sun arrow and its edges are parallel to that direction.
- [ ] Shadow begins at the ellipse edge on the shadow side.
- [ ] Redraw at a new position keeps verticality and shadow direction consistent.
- [ ] Labels and line style follow the stated convention; valid alternative styles are accepted if checks pass.

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