Draw a Sucker Candy: Stick, Disc Body, and Wrapper Twist

Original tasks 1, 2 / complete keys

Task 1

A sucker drawing uses a stick width of 2 units and a length of 10 units. The disc diameter is 6 units. Calculate the stick width-to-length ratio and the disc diameter-to-stick-length ratio. State whether the stick is narrower than the disc.

Answer: Stick width-to-length ratio is 2 to 10, which simplifies to 1 to 5. Disc diameter-to-stick-length ratio is 6 to 10, which simplifies to 3 to 5. The stick width is 2 units and the disc diameter is 6 units, so the stick is narrower than the disc.

Reason: Ratios compare two quantities in the same units. Dividing both terms by the same number simplifies the ratio. Comparing 2 units with 6 units shows the stick is one-third the disc diameter.

Check: Multiply the simplified ratio back: 1 times 2 equals 2 and 5 times 2 equals 10, confirming 1 to 5. For 3 to 5, multiply by 2 to get 6 to 10. Compare 2 and 6 directly.

Task 2

A wrapper twist is planned with a pinch point 2 units above the disc top. The disc diameter is 8 units. The plan says the twist height should be about one-quarter of the disc diameter. Does the planned pinch height match the plan? Show the arithmetic.

Answer: One-quarter of 8 units is 2 units, because 8 divided by 4 equals 2. The planned pinch height is 2 units, so it matches the plan exactly.

Reason: A fraction of a quantity is found by dividing the quantity by the denominator. Here the denominator is 4, so 8 divided by 4 gives the target height.

Check: Multiply the result by 4: 2 times 4 equals 8, which recovers the disc diameter. This confirms the quarter relationship.

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Original tasks 3, 4 / complete keys

Task 3

A disc is shaded with a highlight covering one-quarter of its area and a dark crescent covering one-eighth of its area. The remaining area is middle value. If the disc area is 40 square units, calculate the area of each value group and check that the three areas sum to 40.

Answer: Highlight area is one-quarter of 40, which is 10 square units. Dark crescent area is one-eighth of 40, which is 5 square units. Middle value area is 40 minus 10 minus 5, which equals 25 square units. The sum is 10 plus 5 plus 25, which equals 40 square units.

Reason: Each fraction is applied to the total area. The remaining area is found by subtraction. The sum check confirms no area was missed or double-counted.

Check: Add the three areas: 10 plus 5 plus 25 equals 40. Also check fractions: 10 over 40 is one-quarter, and 5 over 40 is one-eighth.

Task 4

A stick is drawn 12 units long and 3 units wide. The disc diameter is 9 units. The twist height is 3 units. Identify which part has the largest vertical extent and calculate the difference between the stick length and the disc diameter.

Answer: The stick length is 12 units, the disc diameter is 9 units, and the twist height is 3 units. The stick has the largest vertical extent. The difference between the stick length and the disc diameter is 12 minus 9, which equals 3 units.

Reason: Vertical extent is compared directly in the same units. The largest value is 12. Subtraction gives the difference between the two largest vertical measurements.

Check: Add the difference back to the smaller value: 3 plus 9 equals 12, confirming the subtraction. Compare 12, 9, and 3 to confirm the largest.

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Source rubric / reflection

- [ ] Stick is drawn as a narrow rectangle with consistent width and a clear length ratio.
- [ ] Disc body is round, centered on the stick line, and overlaps the stick top.
- [ ] Wrapper twist has two flaps with at least one crease line per flap and a clear pinch point.
- [ ] Shading uses at least three values and places the darkest area away from the chosen light direction.
- [ ] The three parts, stick, disc, and twist, are identifiable without labels.
- [ ] Measurements are recorded in consistent units and checked with simple arithmetic.

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