Builder Drawing: Hard Hat, Tool Belt, and Stance

Original tasks 1, 2, 3 / complete keys

Task 1

A builder figure is drawn with the hip line at the fourth part from the ground and the shoulder line at the sixth part. The total height from ground to top is 16 cm. What is the distance from the ground to the hip line, and from the ground to the shoulder line?

Answer: Hip line: 8 cm from the ground. Shoulder line: 12 cm from the ground.

Reason: Each part is 16 cm divided by 8, which is 2 cm. The fourth part is 4 times 2 cm = 8 cm. The sixth part is 6 times 2 cm = 12 cm.

Check: Check by subtracting from the total: the hip line is 16 cm − 8 cm = 8 cm from the top; the shoulder line is 16 cm − 12 cm = 4 cm from the top. Both distances are positive and consistent with the total height.

Task 2

The shoulder width of a builder figure is set to two head-widths. The head width is 3 cm. The feet are placed 5 cm apart. Is the stance narrower or wider than the shoulder width, and by how much?

Answer: The stance is narrower than the shoulder width by 1 cm.

Reason: Shoulder width is 2 times 3 cm = 6 cm. The feet are 5 cm apart. 6 cm minus 5 cm = 1 cm, so the stance is 1 cm narrower.

Check: Compare 5 cm to 6 cm directly; the difference is 1 cm. If the feet were 6 cm apart, the stance would match the shoulder width.

Task 3

A tool belt is drawn as a horizontal band centered on the hip line, extending 2 cm above and 2 cm below the hip line. What is the total height of the belt? If the left side of the belt is drawn 1 cm higher than the right side, is the belt level?

Answer: The total height of the belt is 4 cm. If the left side is 1 cm higher than the right side, the belt is not level.

Reason: The belt extends 2 cm above and 2 cm below the hip line, so the total height is 2 cm + 2 cm = 4 cm. A level belt has both sides at the same height; a 1 cm difference means it is tilted.

Check: Measure the belt height at the left and right sides; both should read 4 cm. Then compare the top edges: if they align horizontally, the belt is level. A 1 cm difference in height between sides means it is not level.

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Original tasks 4 / complete keys

Task 4

A hard hat dome is drawn to cover the upper half of a head oval. The head oval is 4 cm tall. The dome is drawn 3 cm tall. Does the dome cover the upper half of the head? By how much does it differ from the required 2 cm?

Answer: No, the dome is 1 cm taller than the upper half of the head.

Reason: The upper half of a 4 cm head oval is 2 cm. The dome is 3 cm tall, so it exceeds the upper half by 3 cm minus 2 cm = 1 cm.

Check: Measure the head oval height and divide by 2. Compare that value to the dome height; the difference should be 0 cm for an exact cover.

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Source rubric / reflection

- [ ] Stance: feet are about shoulder-width apart and the figure stands on the ground line.
- [ ] Proportion: hip, shoulder, and chin lines are marked and used consistently.
- [ ] Torso: rounded rectangle shape is clear and connects shoulder to hip.
- [ ] Tool belt: level at the hip line with two pouches and a hammer loop.
- [ ] Head and hard hat: oval head with dome-shaped hat and curved brim.
- [ ] Labels: x-height convention and consistent letter style are used.
- [ ] Overall clarity: the figure reads as a builder without extra tools or scene details.

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