

# Practice Problem 1.1

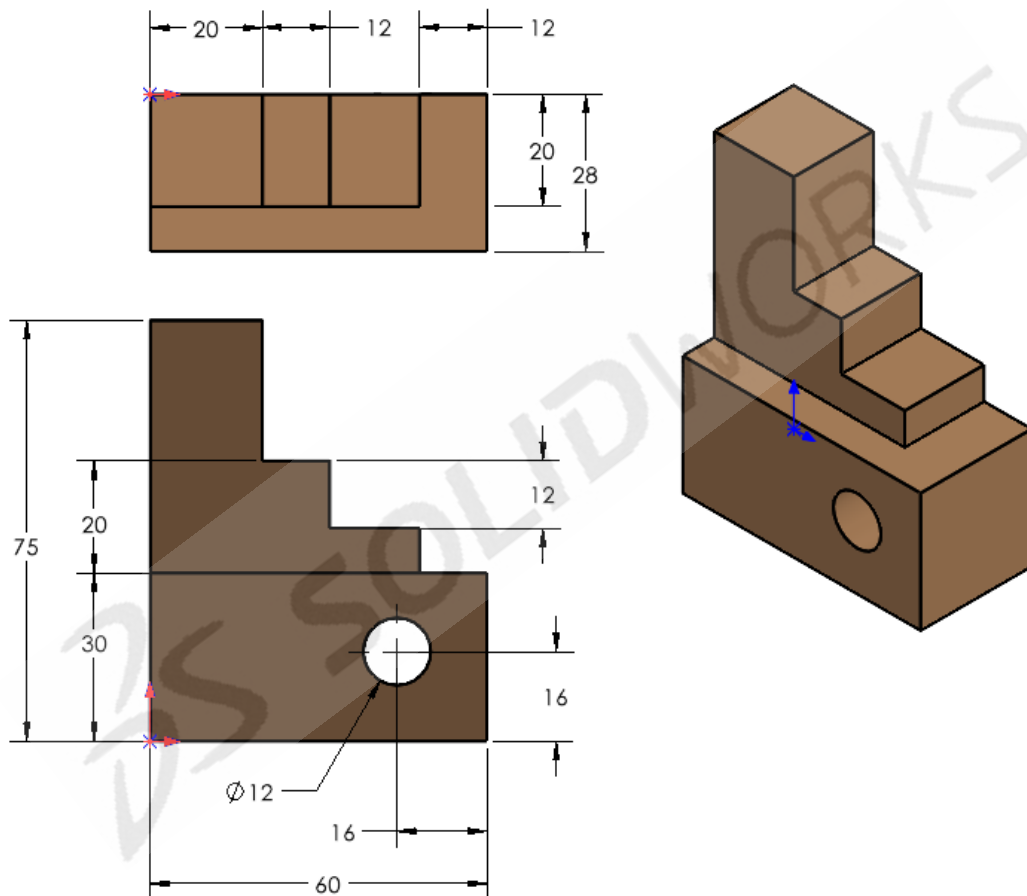
## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 5
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Rectangles, Circles
- Features: Extrude Boss

Volume: 72593 mm<sup>3</sup>



# Practice Problem 1.2

## Basic Sketch and Extrusion (Level 1)

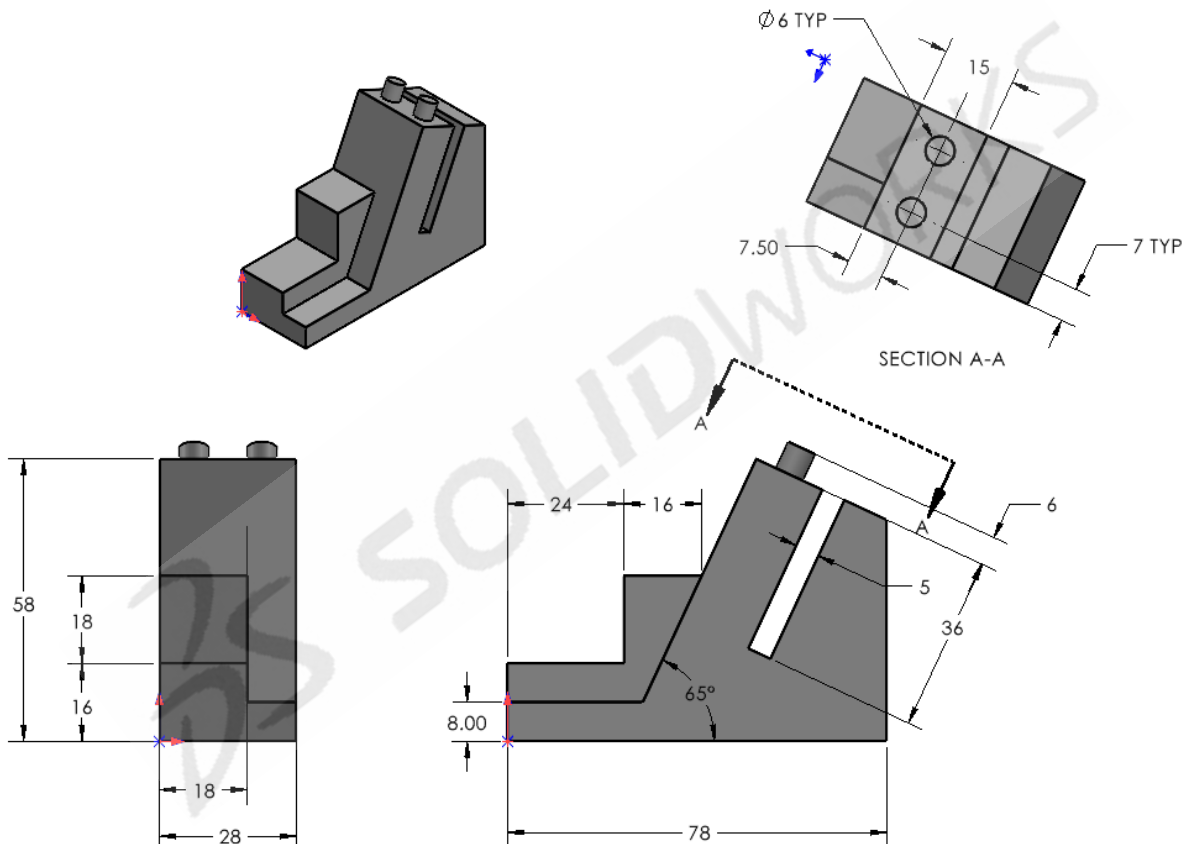
- Units: MMGS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is *asymmetric*.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Circles
- Features: Extrude Boss

HINT: Both circular bosses are the same.

Volume: 70039 mm<sup>3</sup>



# Practice Problem 1.3

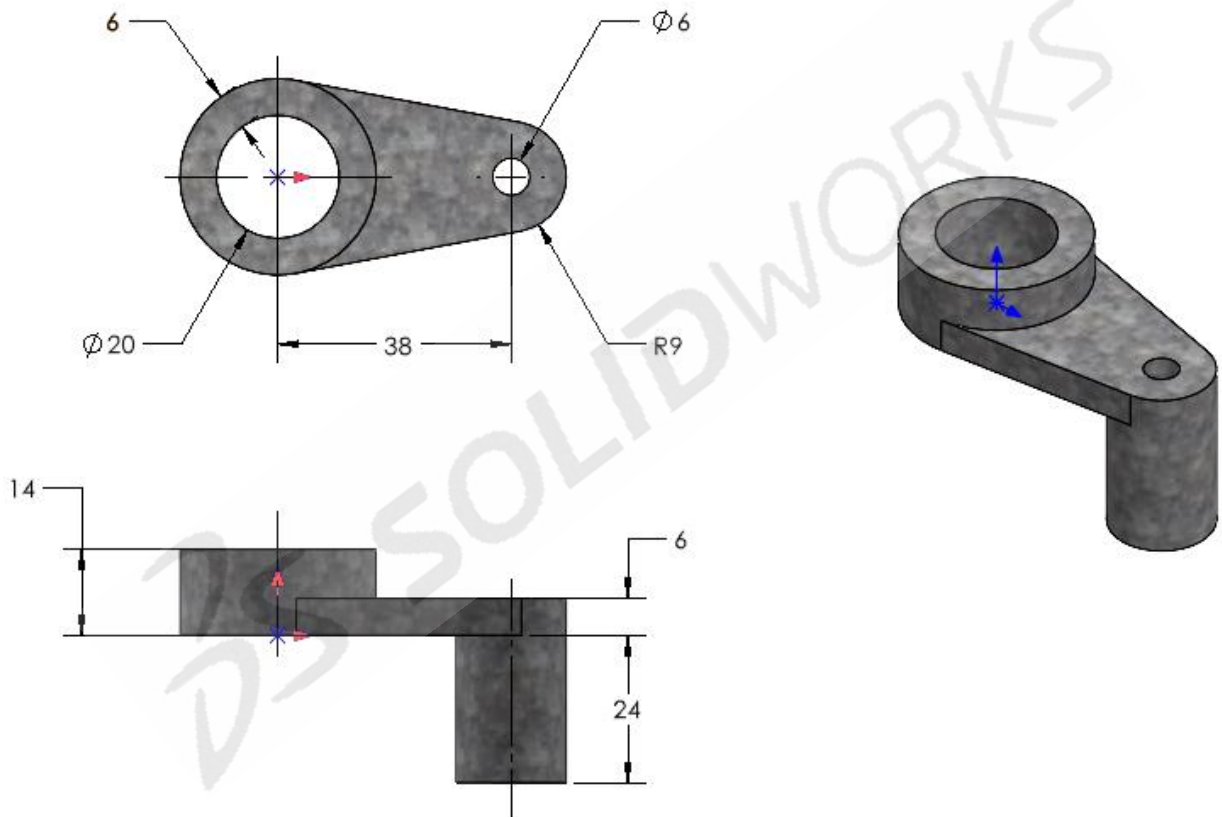
## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 5
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Arcs, Circles
- Features: Extrude Boss

Volume: 16268 mm<sup>3</sup>



# Practice Problem 1.4

## Basic Sketch and Extrusion (Level 1)

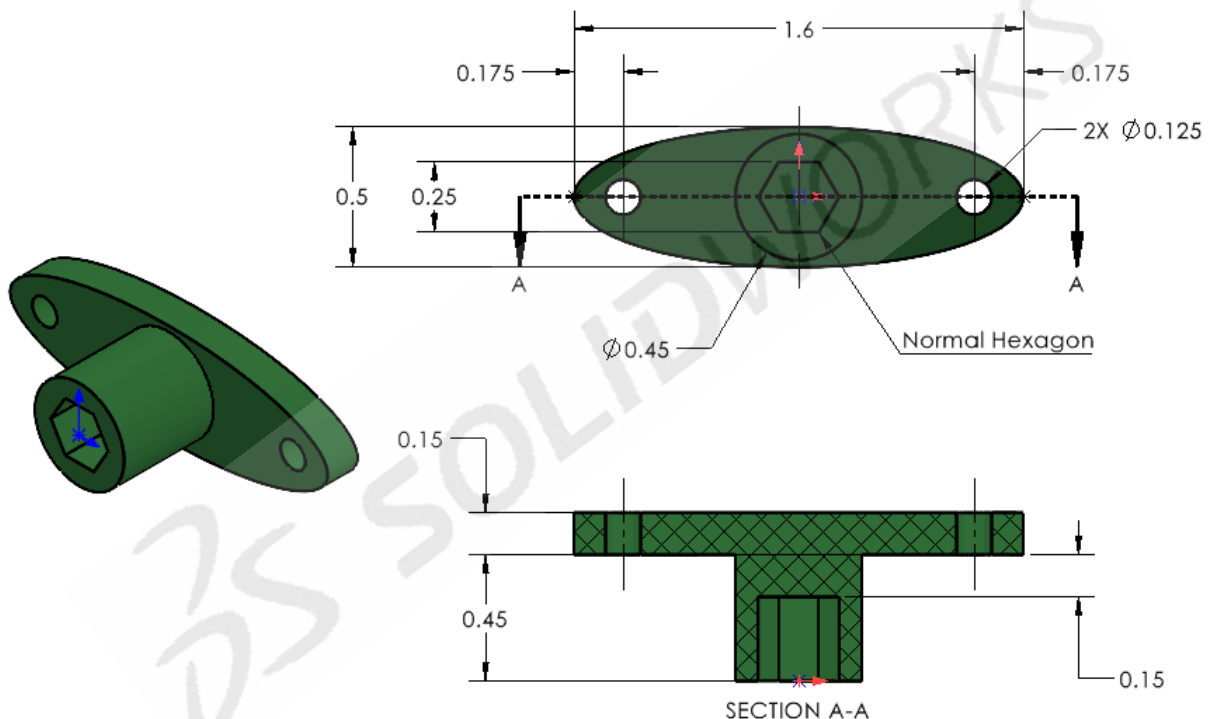
- Units: IPS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Arcs, Circles, Polygons
- Features: Extrude Boss

HINT: Use a 6-sided polygon for the blind hole.

Volume: 0.146 in<sup>3</sup>



# Practice Problem 1.5

## Basic Sketch and Extrusion (Level 1)

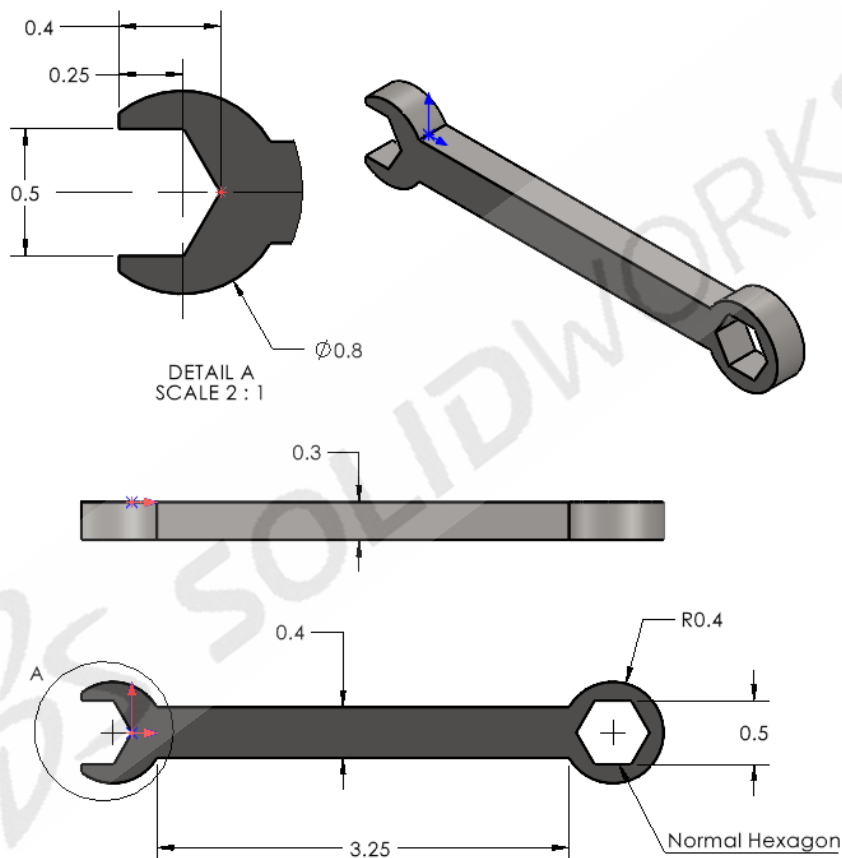
- Units: IPS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Arcs, Circles, Polygons
- Features: Extrude Boss

HINT: Use a 6-sided polygon.

Volume: 0.5492 in<sup>3</sup>



# Practice Problem 1.6

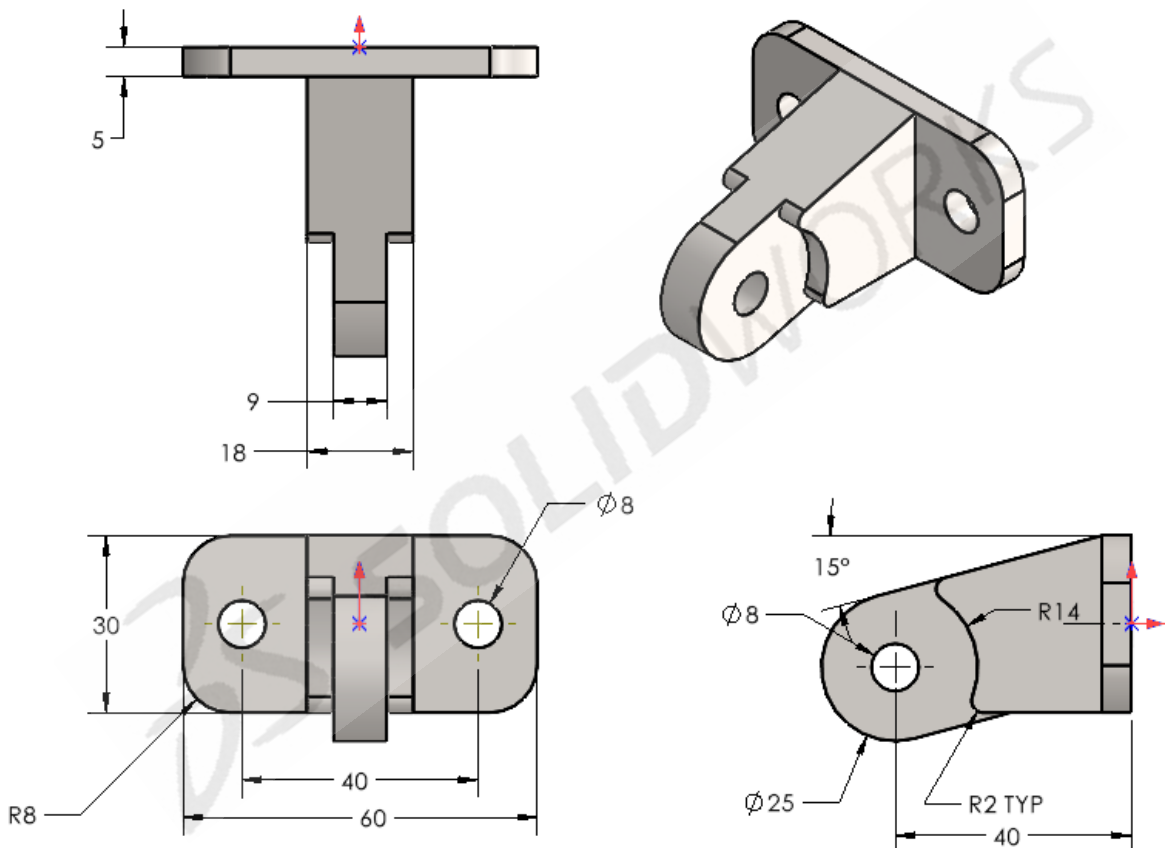
## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Rectangles, Circles
- Features: Extrude Boss

Volume: 24032 mm<sup>3</sup>



# Practice Problem 1.7

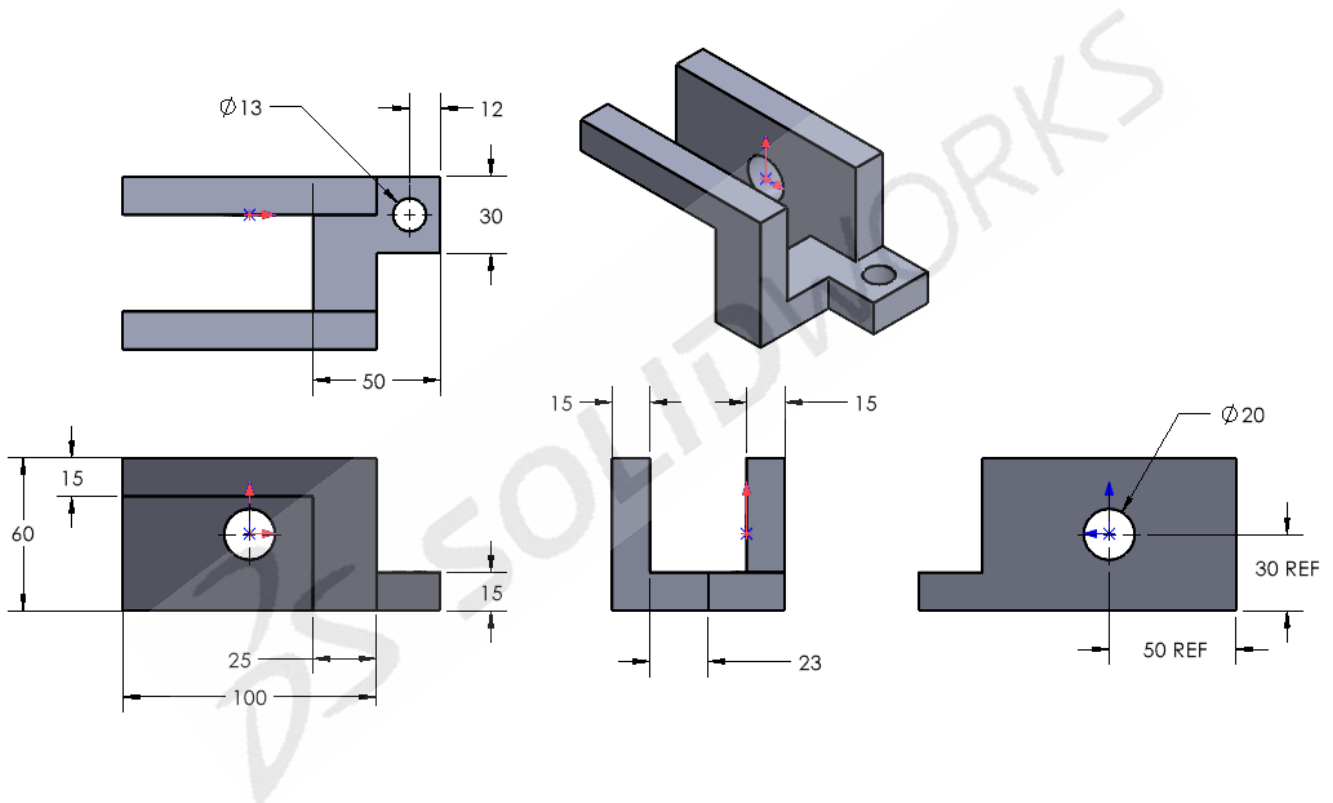
## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Medium
- Certification: CSWA
- Duration (min): 20
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is *asymmetric*.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Rectangles, Circles
- Features: Extrude Boss, Extrude Cut

Volume: 148172 mm<sup>3</sup>



# Practice Problem 1.8

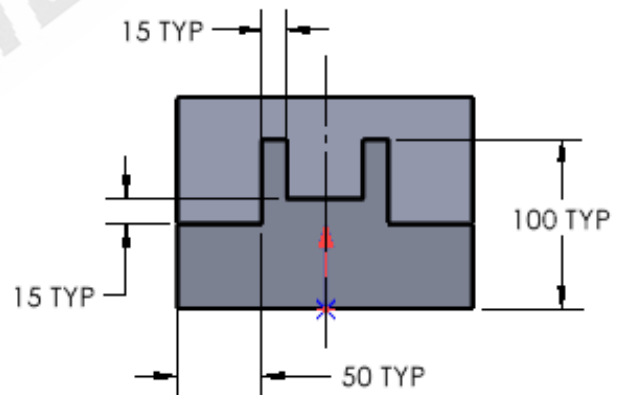
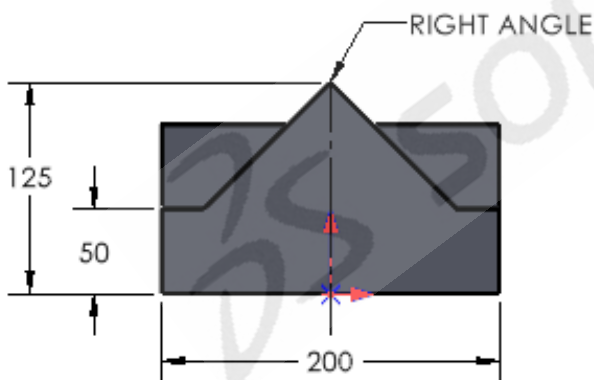
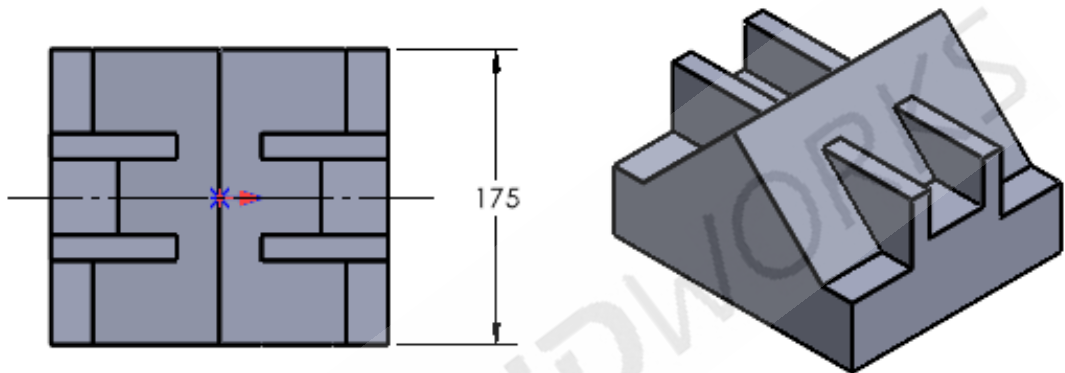
## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Easy
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Rectangles
- Features: Extrude Boss

Volume: 2928250 mm<sup>3</sup>





# Practice Problem 1.9

## Basic Sketch and Extrusion (Level 1)

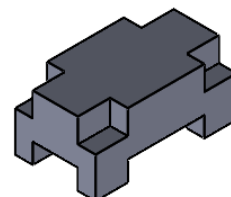
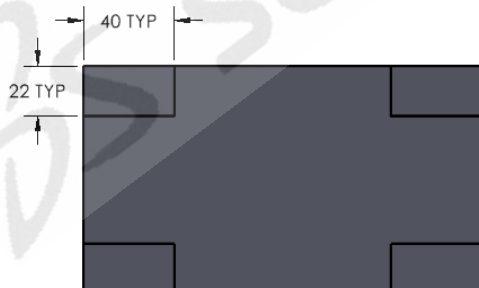
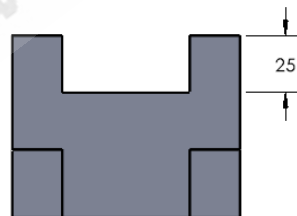
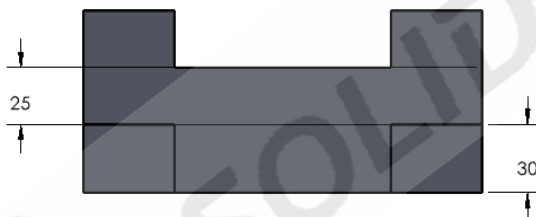
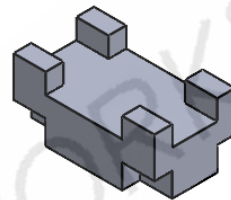
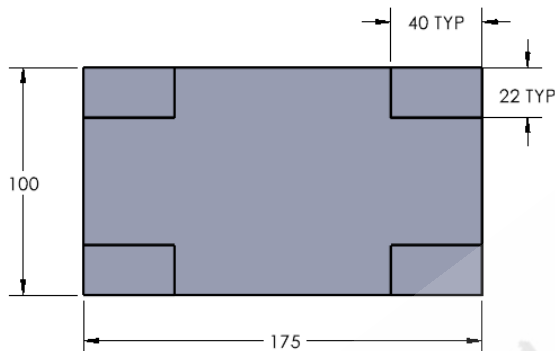
- Units: MMGS
- Difficulty Level: Medium
- Certification: CSWA
- Duration (min): 10
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Centerlines, Circles
- Features: Extrude Boss

HINT: Corner bosses and cutouts are the same size.

Volume: 944900 mm<sup>3</sup>



# Practice Problem 1.10

## Basic Sketch and Extrusion (Level 1)

- Units: MMGS
- Difficulty Level: Medium
- Certification: CSWA
- Duration (min): 15
- Design Intent:
  - The part's origin location is indicated in red.
  - The part is symmetric.
  - All sketches are fully-defined.

## Suggested Sketch Tools / Features

- Sketch: Lines, Rectangles, Circles
- Features: Extrude Boss

## HINTS:

- The 25mm hole is centered on the part, and cuts all the way through the part.
- The 22mm hole is centered on the 36mm wide flange, and cuts through the part.
- Both flanges and the base are the same thickness.

Volume: 45438 mm<sup>3</sup>

