**CSWA Exam Guide:**

1. Overview of exam
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4. Making planes
5. Making origin
6. Reading mass properties/ materials
7. Mating
8. Troubleshooting
9. Part Practice
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Questions/ Comments:

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**Exam Overview:**

Length: 3 hrs

Passing grade: 70%

Retest: 14 days

Regular cost: $100

General topics:

* Sketch entities - lines, rectangles, circles, arcs, ellipses, centerlines
* Sketch tools - offset, convert, trim
* Sketch relations
* Boss and cut features - extrudes, revolves, sweeps, lofts
* Fillets and chamfers
* Linear, circular, and fill patterns
* Dimensions
* Feature conditions – start and end
* Mass properties
* Materials
* Inserting components
* Standard mates - coincident, parallel, perpendicular, tangent, concentric, distance, angle
* Reference geometry – planes, axis, mate references
* Drawing views
* Annotations

Format:

 Several multiple choice questions on view types

 3 Parts (Easy, medium, hard) with 3 different iterations

 2 Assemblies

View your exam states:

<https://3dexperience.virtualtester.com/#account-main>

**View types quiz/ definitions:**

For each of the following, identify and describe the view.

1. 
2. 
3. 
4. 
5. 
6. 
7. 

Answer Key:

1. Broken out section view: exposes the interior geometry.

(Look for a bear took a big chunk out of the part)

1. Auxiliary view: Looks perpendicular to the specified surface

(If there is a construction line at an angle, followed by a view looking perpendicular to that angle, it is probably an aux view)

1. Section view: Cuts a part into a section on a “ cutting plane” to expose hidden geometry

(Look for a dotted line with an arrow on each end)

1. Detail view: Magnifies a section to show the detail that is hard to see in the overall picture

(Look for a circle that has two arrows pointing at each other. Sometimes there are no arrows)

1. Crop view: Isolates a section of a drawing

(is often still the same scale as the parent view)

1. Break view: Shortens a long part by cutting out a long section that has no important or interesting geometry.

(Looks for a zig-zag line)

1. Projected view: Unfolds a view into one of the 8 possible, standard directions.

(The three standard views (Top, front, and right) are also examples of this.)

**Important buttons/ shortcuts/ Icons:**





2D Sketches

3D Objects

View orientation:

Look normal to a plane: Spacebar -> choose panel that you wish to look normal to

Rotate component: Hold middle mouse

Zoom in/out: scroll wheel

Look normal to a surface: Right click on desired (flat) surface, click on 

Add a relation: Hold control

Add a mate: Hold control

Smart dimension:

 

 Or hold the right mouse button and slide upwards

Dimension between the apex of two arcs: Hold shift while dimensioning

Calculating dimensions: use the dimensioning input as an actual calculate (i.e. + - \* /)

Convert a line to construction geometry: Right click

**Part Practice:**

Part 1:

Material: AISI 1020

What is the overall mass of the part in grams?

1. 87.64 grams
2. 11.09 grams
3. 89.26 grams
4. 11.30 grams



Answer: A

Part 1b: Make the following changes. x7 Holes. What is the new mass in grams?

Mass: \_\_\_\_\_\_grams



Answer: 86.47

Part1c: Front face shell of 0.10 mm. What is the center of mass of the part in mm?

X: \_\_\_\_\_mm

Y: \_\_\_\_\_mm

Z: \_\_\_\_\_mm



Answer:

X = 14.59 mm

Y = -20.00 mm

Z = -7.89 mm

**Assembly Practice:**

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Build the assembly. Angle A is 50 degrees. What is the center of mass of the assembly?



A

X = 415.07 mm

C

A

Y = 398.76 mm

Z = 691.17 mm

X = 475.81 mm

D

B

Y = 139.09 mm

Z = -138.03 mm

X = 475.81 mm

Y = 142.58 mm

Z = -142.19 mm

X = 415.07 mm

Y = 402.25 mm

Z = 687.01 mm

Center of mass of assembly:

X: \_\_\_\_\_\_ mm

Y: \_\_\_\_\_\_ mm

Z: \_\_\_\_\_\_ mm

Answer: B

What is the mass of the part in grams?

Mass: \_\_\_\_\_grams

Change angle A to 30 degrees. What is the new center of mass of the part in mm?

X: \_\_\_\_\_\_ mm

Y: \_\_\_\_\_\_ mm

Z: \_\_\_\_\_\_ mm

Answer:

X = 475.81 mm

Y = 142.58 mm

Z = -142.19 mm

**Notes:**

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