

Student Name: \_\_\_\_\_

Unit No. \_\_\_\_\_

9

**Part I.** Place the letter of the key term next to the correct definition.

| Term | Definition   |
|------|--|
|      | The point that a robot turns around, frequently variable, and dependant upon associated forces, torques, and frictions.  |
|      | Designers use this to analyze the function of their products and the design problems they are trying to solve, rather than spending time on the modeling operations necessary to create 3D representations.<br>_____ is not only a set of functions. It supports design by function and adds mechanical content and intelligence. Using _____, you can create mechanically correct components automatically by entering simple or complex mechanical attributes. |
|      | In this type of drivetrain, the frictional force between the wheels and the ground when a wheel or wheels slide(s) across the surface in order for the robot to turn.  |
|      | Another name for “tank drive,” consisting of two independent sets of powered wheels (or treads), one on each side of its chassis.  |
|      | Torque created by the force of driven wheels to the ground or surface. This torque must be greater than the scrub torque in order for a robot to turn.   |
|      | Distance between the center of front and rear wheels of a robot or other vehicle.  |
|      | A gear that resembles a screw. It is a species of helical gear, but its helix angle is usually large (somewhat close to 90 degrees) and its body is usually fairly long in the axial direction. It is these attributes that give it its screw like qualities.  |
|      | Meshes with the worm. It is an ordinary looking, disk-shaped gear, and is sometimes called the <i>wheel</i> or the _____ <i>wheel</i> .  |
|      | Consists of a worm and worm gear. The prime feature of this gear set is that it allows the attainment of a high gear ratio with few parts in a small space.  |

**A.** Worm Gear Set    **B.** Skid Steer    **C.** Functional Design    **D.** Wheelbase  
**E.** Worm Gear    **F.** Center of Rotation    **G.** Worm    **H.** Turning Torque  
**I.** Scrub Torque (Turning Scrub)

**Part II.** Fill in the blanks.

One of the most common types of drivetrain is known as a \_\_\_\_\_ drivetrain, which may also be referred to as a *tank drive*. This type of drivetrain consists of two independent sets of powered wheels (or treads) one on each side of its chassis. By running the sides of the drivetrain at different speeds it is possible to steer the robot

in arcs. This drivetrain is also capable of a \_\_\_\_\_-radius turn (it will spin in place) if the sides are run at the same speed in \_\_\_\_\_ directions.

Scrub torque is the result of the \_\_\_\_\_ force of the wheels multiplied by their distance from the \_\_\_\_\_.

To make a robot turn better, you primarily adjust two things: the \_\_\_\_\_ geometry (wide or narrow, long or short) and the \_\_\_\_\_ in traction between the various wheels (primarily between the front wheels and the back wheels).

**Part III.** Place the letter of the Inventor technical term next to the correct definition.

| Term | Description   |
|------|---|
|      | Use this to quit in-place editing and quickly return to the desired environment. The destination depends on which modeling environment you are working in.  |
|      | Calculates dimensions, force proportions, and loading of worm gearing with common or spiral teeth. The gear has cylindrical worm and globoidal worm gears. It contains the geometric calculation of center distance or the calculation based on the center distance and the calculation of gearing ratio, which enables the design of a gear correction. The generator calculates the main production and check dimensions, size of loading forces, minimum requirements for worm gear and worm materials, and performs the strength check based on the CSN and ANSI standards. |
|      | Consists of the sketch plane, a coordinate system, 2D curves, and the dimensions and constraints applied to the curves.   |
|      | Creates a circle from a center point and radius, or tangent to three lines.   |
|      | Adds dimensions to a sketch. Dimensions control the size of a part. They can be expressed as numeric constants, as variables in an equation, or in parameter files.   |
|      | Creates a feature by adding depth to a sketched profile. Feature shape is controlled by profile shape, extrusion extent, and taper angle. Unless the extruded feature is a base feature, its relationship to an existing feature is defined by selecting a Boolean operation (join, cut, or intersect with existing feature).   |
|      | Part, sheet metal, surface, and assembly features can be mirrored to create and maintain complex symmetrical features, which can also reduce the amount of time required to create a model. Features can also be mirrored when a model body is in an open or surface state.<br>Features can be mirrored about any work plane or planar face. You can mirror solid features, work features, surface features, or the entire solid. A mirror of the entire solid allows mirroring of complex features such as shells or swept surfaces included in the solid.                     |

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|  | One or more features that can be saved and reused in other designs. You can create an _____ from any sketched feature that you determine to be useful for other designs. Features dependent on the sketched feature are included in the _____. After you create an _____ and store it in a catalog, you can place it in a part by dragging it from Windows Explorer and dropping it in the part file or by using the Insert _____ tool. |
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**A. Extrude   B. 2D Sketch   C. Worm Gears Generator   D. Insert iFeature**  
**E. General Dimension   F. Center Point Circle   G. Return   H. Mirror**