

MECHANICAL REASONING PROPS

AT CAL-JAC'S FCTC CENTERS



GEARS

Spur gear: Spur gears or straight-cut gears are the simplest type of gear. They consist of a cylinder or disk with the teeth projecting radially, and although they are not straight-sided in form they are usually of special form to achieve constant drive ratio, mainly involute, the edge of each tooth is straight and aligned parallel to the axis of rotation. These gears can be mated together correctly only if they are fitted to parallel shafts.

Which direction will the blue gear turn?

BELT & PULLEY SYSTEM

BELT AND PULLEY SYSTEM

A belt and pulley system is characterized by two or more pulleys in common to a belt. This allows for mechanical power, torque, and speed to be transmitted across shafts. If the pulleys are of differing diameters, a mechanical advantage is realized.

In this system, assume that the linked pulleys (B and C in the example) run at the same rpm, since they are attached to the same shaft.

- Break the problem down into parts, and calculate them in order.
- Diameter of pulley A: 40mm or pulley B = 20mm, so pulley B will run 1/2 as fast as pulley A, 4000 ÷ 200 rpm.
- You already know that pulley C runs at the same speed as pulley B.
- Diameter of pulley C: diameter of pulley C = 40 ÷ 2 = 20mm, so pulley C will run 1/4 as fast as pulley A, 4000 ÷ 100 = 40 rpm.
- calc = 40 rpm.

A belt drive is analogous to that of a chain drive, however a belt drive may be smooth (consists of discrete interlocking members) or based on a chain sprocket, spur gear, or timing belt) to both the mechanical advantage is approximately given by the ratio of the pitch diameter of the sheaves only, not based exactly by the ratio of teeth as with gears and sprockets.

ROPE & PULLEY

ROPE AND PULLEY

A pulley is a wheel on an axle or shaft that is designed to support movement along the change of direction of a cable or belt, or apply forces and to transmit power. Several ways to lift loads, apply forces and to transmit power.

to allow for raised a heavier or denser and requires less force between the larger around its shaft. The drive element of the pulley system may be a cable, belt, or rope that runs over the pulley. Pulleys are described and used to make it easier to provide mechanical advantage to carry large loads. Pulleys are used in a variety of ways to lift and transport heavy loads from one location to another.

LEVER

CLASS TWO LEVER

FLUID DYNAMICS



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