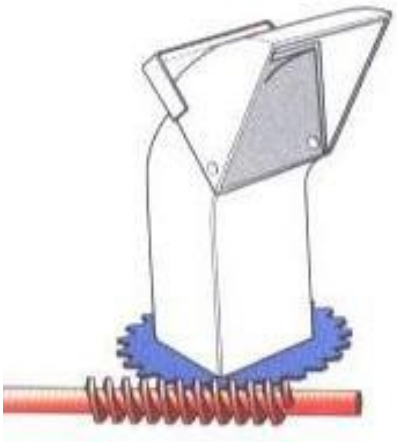
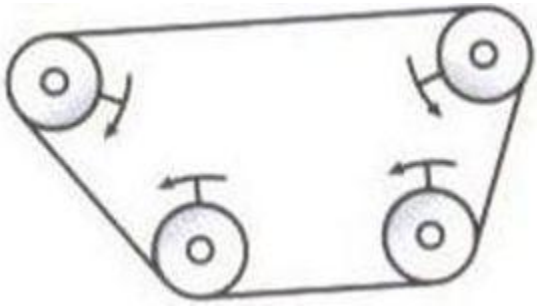


1. Use the velocity (speed) ratio and mechanical advantage to explain why it makes sense to use a worm gear system for a snow blower.

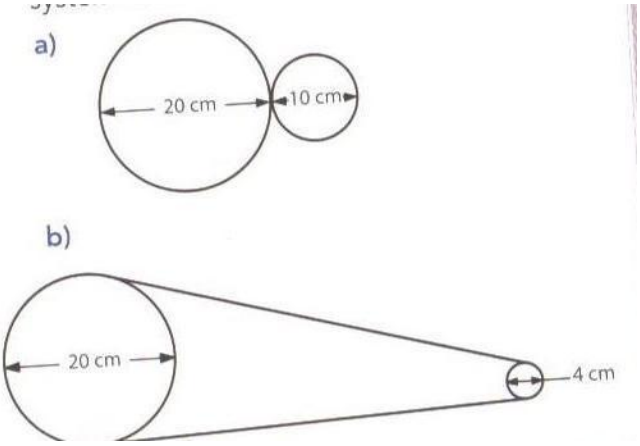
The worm gear system has a high mechanical advantage, so the gained force will come in handy to turn the heavy blower part.

2. The following diagram shows the incorrect motions. Fix it.



All the wheels should be moving in the same direction.

3. a)When the velocity ratio is high, it will be hard to pedal but the back wheel will move fast. If(b) was a bicycle, redraw the back(small) gear, so that the velocity ratio would become 4/1 instead of 5/1 and therefore slightly easier to pedal.



Make the back gear 5 cm, so that the ratio becomes 20/5 = 4/1.

b) What would be the mechanical ratio in (a) if the small gear was the input gear?

M = Out/In = 20/4 = 5/1

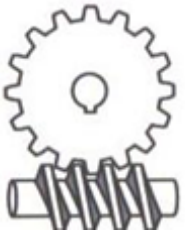
c) What kind of gear system would (b) be if it involved a toothed gear and a chain?

Chain-sprocket system

d) What kind of gear system would (b) be if it involved smooth wheels?

Belt-pulley system

4. a) What kind of gear system is shown to the right?

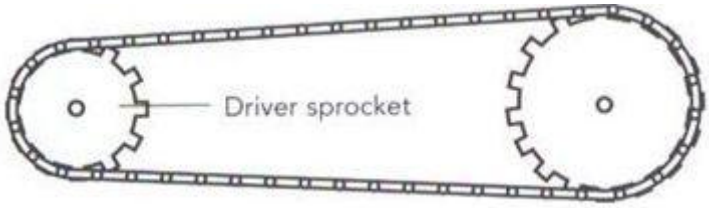


Worm-worm gear system

b) If the worm is considered to have a single tooth, what is the mechanical advantage of this system?

M = Out/In = 16/1 Remember the worm is always the input.

5.



a) If the driver sprocket around turns clockwise, in what direction will the larger wheel turn?

clockwise

b) If the 12-toothed wheel makes 4 turns, how man turns will be made by the 16-toothed wheel?
Two ways of doing this: The large wheel will only move 12/16 times as fast, so it will make (12/16)(4) = 48/16 = 3 turns
Or 12(4) = 16x
X = 3 turns.