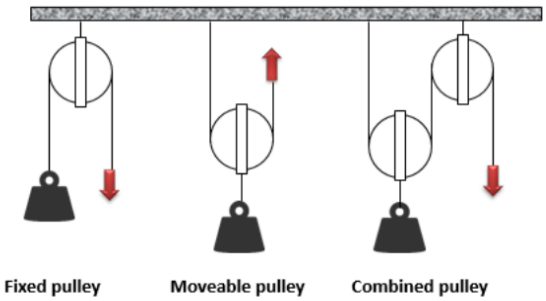
Name:

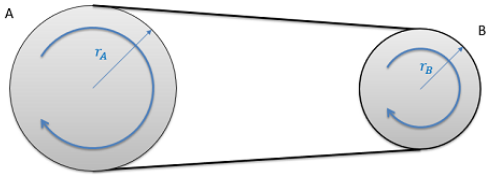
COLONIAL CHRISTIAN SCHOOL

Physical Science: Math for Levers, Pulleys, Gears and Belts

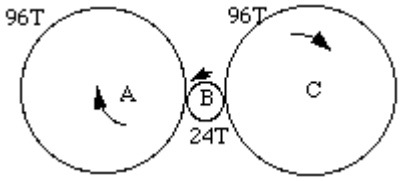
1. Write the ideal mechanical advantage for the four pictures below.



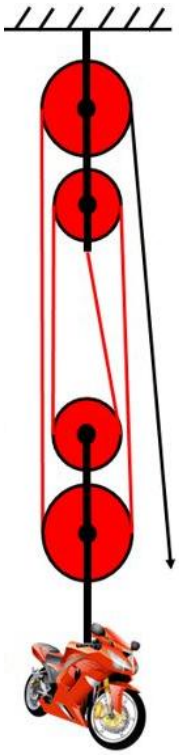
Input Radius 10 Output Radius 8



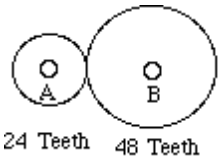
2. Gear A is turning 20 RPMs. How fast is C turning?

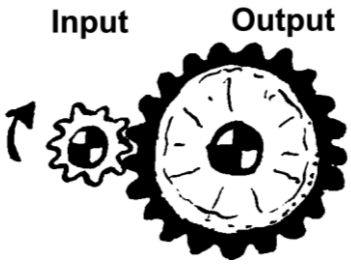


3. The motor cycle weighs 100 kg. How many kg of force would it take to lift it using the pulley system to the right?

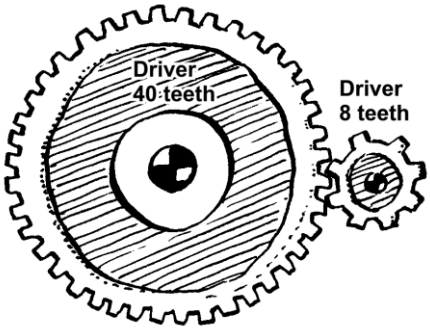


4. Gear B is rotating at 10 RPMs. How fast is B rotating?





5. How fast would the 40 tooth gear below need to turn to make the 8 tooth gear go 320 RPM?



6. If the input gear above can turn with a torque of 50N, how much torque does the output gear have?

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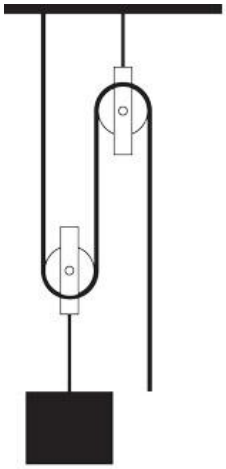
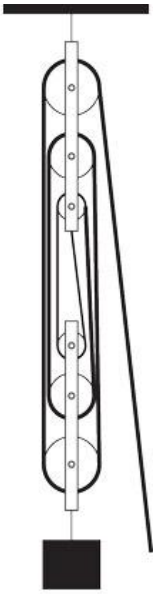


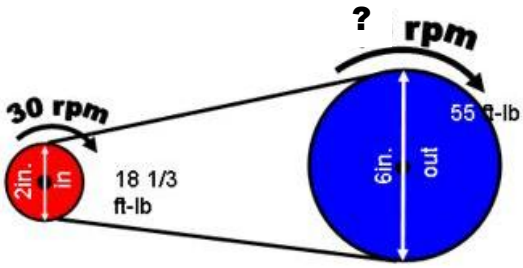
Example 1



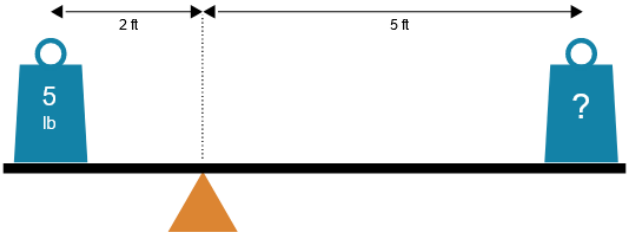
Example 2

7. In the examples to the right, how much rope would need to be pulled to lift the weight 1 meter?

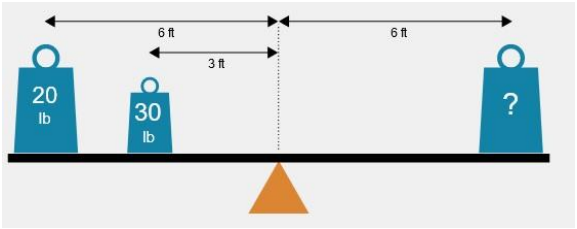
8. In the belt driven system below, how fast would the second wheel turn?

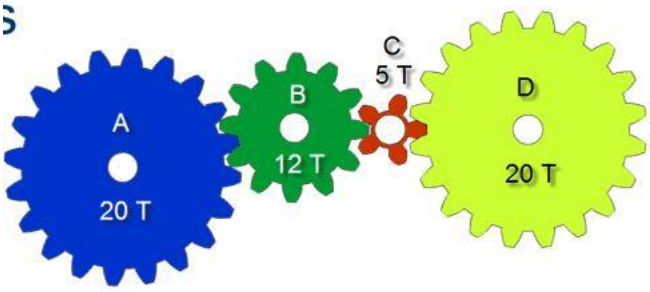


9 What weight balances the lever below?



10. What weight balances this lever?





11. If gear A is turning 100 RPM clockwise, which direction is gear D turning and how fast is it going?

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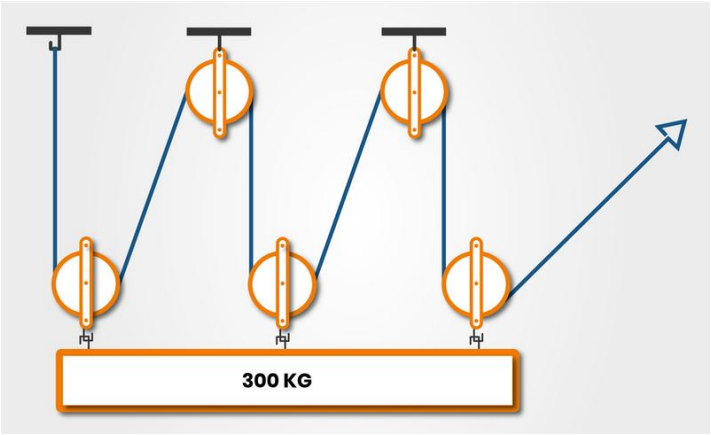
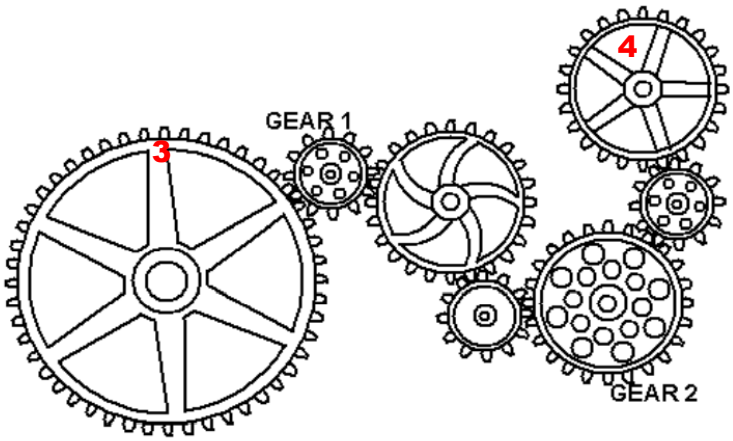
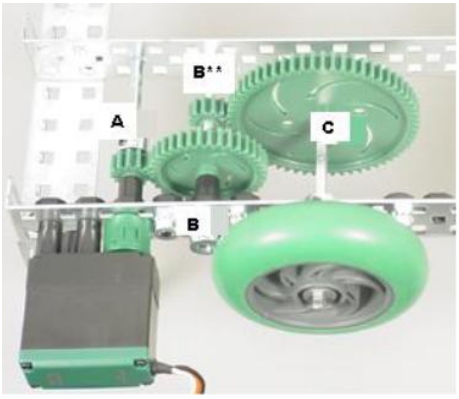


12. How many Newtons does it take to lift the bar to the left?

13. Extra Credit: In the picture to the right, gear 3 is turning counter colockwise at 1000 RPM. How fast is gear 4 turning?





14. Extra Credit: A has 10 teeth. B has 40 teeth and a 10 tooth gear connected to it on an axel. C has 50 teeth. What is the value for this speed multipler?