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1.1.2 simple machines practice part 2

General Unit 1.1 - Essential Questions, Concepts and Vocabulary Unit 1.1 - Vocabulary Crossword Puzzle Unit 1 - Engineering notebooks Unit 1.1 - simple machines part 1: lever, wheel & axle, pulleys Presentation 1.1. Simple Machines, Part 1 Simple Machines 1: Student Notes Activity 1.1.1, Part 1 - Lever, Wheel & Axle, Pulleys - MS Word Activity 1.1.1, Part 1 - Lever, Wheel & Axle, Pulleys - PDF Video Resources Unit 1.1 - simple machines part 2: inclined plane, wedge, screw Presentation 1.1. Simple Machines, Part 2 Unit 1.1.2 - Simple Machine Practice Problems Unit 1.1.3 - 1.1.5 - Gears, pulley drives & Sprocket Drives Presentation 1.1.3: Gears, Pulley Drives & Sprockets Unit 1.1 - Tests/Quizzes additional resourcesMechanisms - Engineering Formula Sheet Wilson Technology & Engineering © 2012 Created by Introduction in the last activity, building and using simple machines and making measurements of forces and distances gave you concrete examples using mechanisms. Only from a good plan, however, can an engineer deduct how a mechanism will transform forces and distances from input to output -- from effort to resistance. Build a good layout of a mechanism and make detailed predictions based on your plan of a great problem solving skills mechanism that will help you design the mechanism for a specific task. The procedure for answering the following questions about machine systems is simple. Each question requires proper illustration and reference, including the labeling of forces, distances, directions, and unknown values. Illustrations must be composed of simple machine-based functional designs while realistic visualizations. Be sure to document all the steps of the solution and the appropriate units. All issue calculations should assume ideal conditions without losing friction. Simple machines – the first-class lever lever in static balance has a resistance force of 50 pounds and 15 pounds of effort force. The lever effort force is located 4 feet away from Fulchrom. 1. Layout and annotate the lever system described above. 2- What is the real mechanical advantage of the system? Replace Formula/Solve Final Reply 3. Calculate the length from fulchrome to resistance force using static equilibrium calculations. Alternative formula/solving the final barrow wheel response is used to lift the load of 200 pounds. The length from the center of the wheel to the center of the load is 2 feet. The length from wheel to attempt is 5 feet 4. The lever system described above shows and describes it. 5- What is the ideal mechanical advantage of the system? Replace formula/solve final reply 6. Calculate the ideal force of effort needed to overcome the resistance force in the system using static balance calculations. Replace the formula/solve the medical technician's final response using a pair of four-inch-length tinglys to remove a wood branch from a patient. Technician 1 pound squeezing force into the pulpit. If more than 1.5 pounds of force is applied to the spinner, it will be difficult to break and remove it. 7. Layout and annotate the lever system described above. 8- What is the real mechanical advantage of the system? Alternative Formula/Solve Final Reply 9. Using static balance calculations, calculate how far fulchrome tingcroks should be held to avoid damaging the branch. Alternative Formula/Final Solution Simple Machine Response – Wheel and Axis 10. What does the linear distance in a one-wheel revolution with a diameter of 36 go through? Replacing the formula/solving the final response of the tap off industrial water is designed to work with a 30 pound force attempt. The valve will face 200 pounds of resistance force applied to a 1.5-magnitude diagonal axis. 11. Layout and description of wheel and axle system described above. 12- What is the real mechanical advantage required by the system? Replace formula/solve final reply 13. What is the diameter of the wheel needed to overcome the resistance force? Alternative formula/final solution simple machine response – Polk system several times during a day, construction crews lift about 560 pounds of material from a flatbed truck to a 32-foot roof. The block and tackle system with a 50 pound force attempt is designed to lift the material. 14. Real mechanical advantage required? Replace formula/solve final reply 15. How many supporting disciplines will be needed in the Kashki system? Alternative formula/solving the final response block and tackling the system with nine support strings are used to pick up a metal clothing machine in a production center. A motor used to inflate the cable in the kashki system can provide 100 pounds of power. 16- What is the mechanical advantage of the system? Alternative Formula/Solve Final Reply 17. What's the maximum weight? Alternative formula/final solution simple machine response – aircraft desire civil engineer should design wheelchair ramps available alongside a set of steps leading to a building. The height from the ground to the top of the stairs is 2 feet. According to ADA codes, the slope must be 1:12 or less. The slope is equal to the increase of ramps divided by run ramps. 18. The design and description of the desire aircraft described above. 19. Using the ADA code, what is the minimum allowable length of the ramp base? Replace formula/solve final reply 20. Using the known height and the calculated base length, what is the slope length of the ramp? Replace formula/solve final reply 21. What is the ideal mechanical advantage of ramps? Replace formula/solve final reply 22. If a person and wheelchair weigh a combination of 185 pounds, how much ideal effort force is needed to travel up ramps? Alternative Formula/ Solving Final Response Simple Machine – Hydraulic Pear Waj used in To cut large sheets of metal. Using hydraulic pressure, the machine presses a wedge formed in the form of a reluctant aircraft — not two faces like an axe — to cut off the metal. (Imagine one side or blade of a pair of scissors.) In this problem, a shear has a 1.4-inch thick cutting blade with a slope of 45 degrees between the sides of the blade. Hydraulic pressure applies a 2,000-pound force to a wedge. 23. Sketch and describe the wedge described above. 24. What is the length of the slope? Replace formula/solve final reply 25. What is the ideal mechanical advantage of The Dodge? Alternative formula/final solution simple machine response – Screw 7/16 nut driver with 1 1/2 inch handle diameter used to install UNC 1/4-20 screw into robotic arm. 26. Design and description of the screw system described above. 27. Determine the location of the attempt. Replace formula/solve final reply 28. Determine the pitch of the screw. Replace formula/solve final reply 29. What is the mechanical advantage gained in the system? Replace formula/solve the final answer 30. How much can the ideal force be overcome if 5 pounds of force is applied? Formula Substitute / Solve Final Answer 148609799 02/02/2017 11:59pm Date:8/26/14Intro: In this activity, we use formulas that we learned from 6 simple machines in training problems. I used basic AMA and IMA formulas during this activity. We had complicated problems in this activity. The procedure for answering the following questions about machine systems is simple. Each question requires proper illustration and reference, including the labeling of forces, distances, directions, and unknown values. Illustrations must be composed of simple machine-based functional designs while realistic visualizations. Be sure to document all the steps of the solution and the appropriate units. All issue calculations should assume ideal conditions without losing friction. Simple machines – LeverA's first-class lever in static balance has a resistance force of 50 pounds and 15 pounds of effort force. The lever effort force is located 4 feet away from Fulchrom. The design and description of the lever system described above. What is the actual mechanical advantage of the system? FormulaSubstitute / SolveFinal AnswerAMA=Fr/Fe50/15=3.333.33Using static equilibrium calculations, calculate the length from the fulcrum to the resistance force. FormulaSubstitute / SolveFinal AnswerFeDe=FrDr15lb 4=50lb Dr1.2=DrA wheelbarrow is used to lift a 200-pound load. The length from the center of the wheel to the center of the load is 2 feet. The length of the wheel to the effort is 5 feet. The lever system described above shows and describes it. What is the ideal mechanical advantage of the system? FormulaSubstitute / SolveFinal AnswerIMA=De/Dr5/2=2.52.5Using static equilibrium calculations, calculate the ideal effort force needed to overcome the resistance force in the system. FormulaSubstitute / AnswerFeDe=FrDrFe5=200lb2Fe=200lbs.4=8080lbA medical technician uses a pair of four inch long tweezers to remove a wood sliver from a patient. شرح و شرح سیستم اهرم شد. طرح و شرح سیستم اهرم شد. حذف آن دشوار خواهد شد. تکیستن و شکستن و حذف آن دشوار خواهد شد. ۱/۵ پوند نیرو به اسپینتر اعمال شود، شکستن و حذف آن دشوار خواهد شد. FormulaSubstitute / SolveFinal AnswerFe+Fr/De+Dr=%1 / 1/2 / 1 / 1=1/2.5Simple Machines – Wheel and Axle What is the linear distance traveled in one revolution of a 36 in. diameter wheel? FormulaSubstitute / SolveFinal AnswerdRevolutions=linear distance3.14 x 36in x 1=113in113inAn industrial water shutoff valve is designed to operate with 30 lb of effort force. در 1.5 پوند نیروی مقاومت اعمال شده به محور قطر 1.5 شیر با Fr= 1/2d wheel x Fe.75in x 200lbs=1/2d wheel x 30 lbs10inSimple Machines – Pulley SystemA construction crew lifts approximately 560 lb of material several times during a day from a flatbed truck to a 32 ft rooftop. مزیت مکانیکی واقعی مورد نیاز چگونه است؟ FormulaSubstitute / SolveFinal AnswerDe/Dr32/122.666A block and tackle system with nine supporting strands is used to lift a metal lathe in a manufacturing facility. شیب برابر است با افزایش رمب تقسیم شده توسط اجرای رمب. طرح و شرح هواپیما نمایان شرح داده شده در بالا. با استفاده از کد ADA، ارتفاع از زمین تا بالای پله ها ۲ فوت است. بر اساس کدهای ADA، ارتفاع از زمین تا بالای پله ها ۲ فوت است. مزیت مکانیکی واقعی مورد نیاز چگونه است؟ FormulaSubstitute / SolveFinal AnswerFr/Fe=AMA560 lbs / 50 lbs=AMA=11.2How many supporting strands will be needed in the pulley system? FormulaSubstitute / SolveFinal AnswerDe/Dr100/911 lbsSimple Machines – Inclined PlaneA civil engineer must design a wheelchair-accessible ramp next to a set of steps leading up to a building. پوند نیرو را فراهم کند. مزیت مکانیکی سیستم چگونه است؟ FormulaSubstitute / SolveFinal AnswerHeight x run/rise = bottom length2ft x 12 / 1=24ft Using the known height and calculated What is the length, length of ramp slope? FormulaSubstitute / SolveFinal Answera^2 + b^2=c^22 ft^2+24 ft^2=c^2224.08 ft what is the ideal mechanical advantage of the ramp? FormulaSubstitute / SolveFinal AnswerIMA=L/H24 ft/2 ft=IMA=12 ft If a person and wheelchair have a combined weight of 185 lb, how much ideal effort force is required to travel up the ramp? FormulaSubstitute / SolveFinal Answer%eff=(AMA/IMA)100AMA=Fr/Fe100=(12/12)10012=185/Feldeal effort force =15.42lbsSimple Machines – WedgeA hydraulic shear applies a 2000 lb force to a wedge. It is used for plate steel shear to rough size. The shear has a shear blade with a thickness of 1.4 inches with a slope of 45 degrees. (Note 45°, 45°, 90° triangle) The design and wedge description described above. What is the length of the slope? FormulaSubstitute / SolveFinal Answer1/8 What is the ideal mechanical advantage of The Dodge? FormulaSubstitute / SolveFinal AnswerIMA=L/H1/8/1/4 1/2 Simple Machines – ScrewA 7/16 Nut Driver with 1 1/2 inch handle diameter used to install UNC 1/4 20 screw into robotic arm. The design and description of the screw system described above. Set around the location of the attempt. FormulaSubstitute / SolveFinal Answer=2πrCircumferencec1.5in x 3.14=4.71in. Determine the pitch of the screw. FormulaSubstitute / SolveFinal Answerpitch=1/TP1pitch=1/20.05 What is the mechanical advantage gained in the system? FormulaSubstitute / SolveFinal AnswerIMA=Circumference/PitchIMA=(1/4in 3.14)/.0515.7 How much can the ideal force overcome if 5 pounds of force is applied? FormulaSubstitute / SolveFinal AnswerAMA=Fr/Fe15.7=Fr/578.5 AnswerAMA=Fr/Fe15.7=Fr/578.5