Unit 4 - Worksheet 7

Force Diagrams 2

In each of the following situations, a rock experiences one or more forces. All drawings are in a vertical plane, and friction is negligible except where noted. Draw accurate force diagrams showing all forces acting on the rock. The length of each force should be in proportion to its magnitude. Each diagram should include a dotted line drawn around the system that you have defined for the problem. Each force should be labeled with a capital F, followed by a subscript which describes the type of force, followed by two subscripts which describe the “agent” of the force and the “object” of the force. Draw forces in pencil and use a ruler. Include force components, drawn in red, whenever forces which are not all parallel and or perpendicular to each other are present.



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| 1. Static Equilibrium | 2. Static Equilibrium | 3. Friction preventing sliding |
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| 4. Static Equilibrium | 5. Static Equilibrium | 6. Static Equilibrium |
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| 7. Static Equilibrium | 8. Static Equilibrium | 9. Rock is sliding down a frictionless incline |
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| 10. Rock is falling. No air resistance. | 11. Rock is sliding at constant speed on a frictionless surface. | 12. Rock is falling at constant (terminal) velocity. |
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| 13. Rock is slowing down because of friction. | 14. Rock is rising in a parabolic trajectory. | 15. Rock is at the top of a parabolic trajectory. |
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| 16. Rock is tied to a rope and pulled straight upward, accelerating at 9.81m/s/s. | 17. Rock is tied to a rope and pulled so that it moves horizontally at constant velocity. Air resistance is present. | 18. Rock is tied to a rope and pulled so that it accelerates horizontally at 19.6m/s/s. |
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| 19. Make up your own static  equilibrium situation for the rock. | 20. Make up your own constant velocity situation for the rock. | 21. Make up your own uniformly accelerating situation for the rock. |
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