Tracking Sharks

You are an engineer in charge of testing new equipment that can detect shark trackers from the air. The equipment in the drone can detect the shark tracker within a total distance of 750 feet. Each hour on the hour the tracker sends a signal of its location to the drone. You are flying a drone 250 feet above the surface of the ocean.

- It is 9:00 am when the drone first detects the shark tracker.
- At 9:00 am the shark is 275 feet below sea level.
- At 10:00 am the shark is 392 feet below sea level.
- From 10:00 am to 11:00 am the shark descends 85 feet.
- From 11:00 am to noon, the shark dives again, descending by an amount equal to the average of the first two dives.
- a) At which hours will the drone be able to detect the shark? Justify your thinking.

b) What depth change can the shark make from 12pm – 1pm that will allow the shark to be **detectable** by the drone? Explain how you know.

c) What depth change can the shark make from 12pm – 1pm that will allow the shark to be **undetectable** by the drone? Explain how you know.

Virginia Department of Education

Copyright ©2020 by the Commonwealth of Virginia, Department of Education, P.O. Box 2120, Richmond, Virginia 23218-2120. All rights reserved. Except as permitted by law, this material may not be reproduced or used in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, without written permission from the copyright owner. Commencial educational purposes without requesting permission. All others should direct their written requests to the Virginia Department of Education at the above address or by e-mail to vdoe.mathematics@doe.virginia.gov