

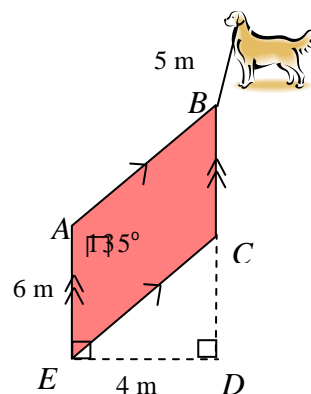
Grade 9

EXTRA CHALLENGES - SET I

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1. In the diagram, Kwela, the family dog is tied outside the house, $ABCE$ with a 5-metre leash at point B . In front of the house is a garden, $\triangle CDE$, in which Kwela is free to play.

If $AE = 6$ m, $ED = 4$ m, $\angle EAB = 135^\circ$, $\angle AED = \angle BDE = 90^\circ$, and $AB \parallel EC$, determine the largest area that Kwela can walk around when he is on his leash.



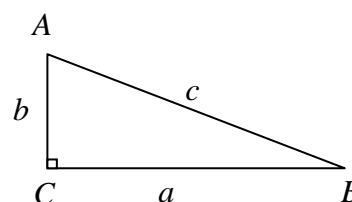
2. An ice cube has an initial volume of 216 cm^3 . If it's left on a counter, it will reach $\frac{1}{6}$ its original surface area in 5 minutes. If the cube maintains its shape and loses the same volume every minute, how long will it take for the ice cube to completely melt?

Did You Know?

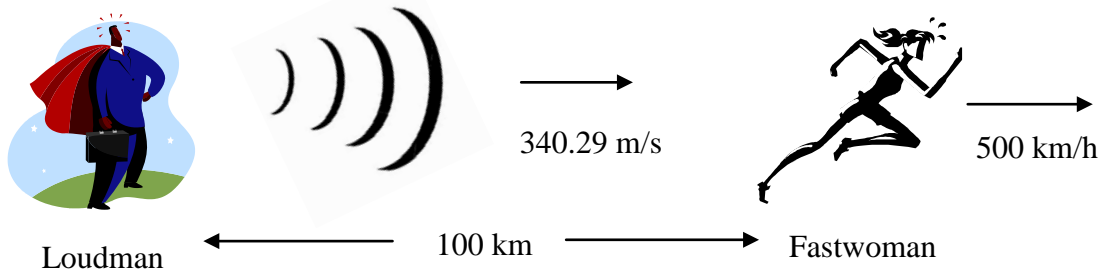
Water is the only substance on earth that expands when it freezes. The water molecules actually get less dense, which is why ice cubes float in your drinks. In fact, the Celsius temperature system is based upon the freezing (0°C) and boiling (100°C) point of water.



3. In $\triangle ABC$, $a - b = 5$ and the area is 50 cm^2 . If $\angle C = 90^\circ$, find the length of c .



4. a. Loudman, the newest superhero has the ability to be heard from anywhere on the planet. He wants to tell Fastwoman, who is currently 100 km away, a message. If Fastwoman is running away from Loudman at a speed of 500 km/h, and sound travels at 340.29 m/s, approximately what time will the message reach Fastwoman?



- b. The message Loudman gave to Fastwoman was “You forgot your lunch!” If it takes 4 seconds for Fastwoman to stop and 4 seconds to get back up to top speed of 500 km/h, how many minutes will it take for Fastwoman to stop, turn around and return to Loudman to get her lunch?

5. If a and b are positive integers from 1 to 20 inclusive, and $c = \frac{a}{b}$, determine the number of triples (a, b, c) such that c is an integer.



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