TWB252

Tutoriaal 5

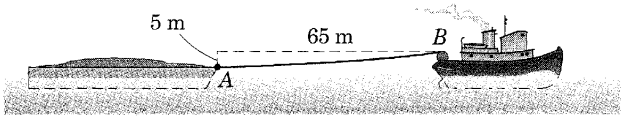
20 September 2017

U skryf 'n toets na afloop van die tutoriaal.

1. Do problem 5/138 in Meriam.

(Use the formulas for small sag.)

***5/138** A power tug is towing a barge with a cable which has a mass of 14 kg per meter of its length. It is observed that the tangent to the cable at point A is horizontal. Determine the tensions at A and B.

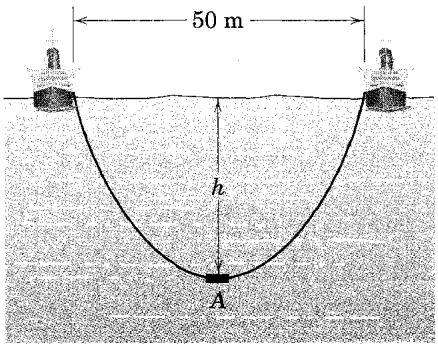


Answers: $T_A = 58.0$ kN; $T_B = 58.7$ kN

2. Do problem 5/219 in Meriam.
(Use Newton's method.)

***5/219** An underwater detection instrument A is attached to the midpoint of a 100-m cable suspended between two ships 50 m apart. Determine the depth h of the instrument, which has negligible mass. Does the result depend on the mass of the cable or on the density of the water?

Ans. $h = 39.8$ m



Answer: $h = 39.7$ m

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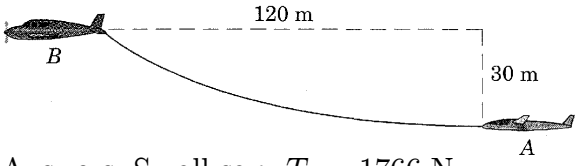
You write a test at the end of the tutorial.

3. Do problem 5/146 in Meriam.

(First use the formulas for small sag and then use Newton's method. Compare the results.)

***5/146** The glider A is being towed in level flight and is 120 m behind and 30 m below the tow plane B. The tangent to the cable at the glider is horizontal. The cable has a mass of 0.750 kg per meter of length. Calculate the horizontal tension T_0 in the cable at the glider. Neglect air resistance and compare your result with that obtained by approximating the cable shape by a parabola.



Answers: Small sag: $T_0 = 1766$ N;
Newton's method (any sag): $T_0 = 1801$ N