**Subject n°10**

QUADRATICS

Please do not write on the exam paper, and do not forget to give back the examination paper at the end of the test.

Zoltan is playing football :

He kicks the ball from point Z and we suppose that the equation $y = -0,025\,(x-20)^2 + 10$ represents the path the ball takes through the air, where x is the distance from point Z and y is the height of the ball from the ground (both measures are in metres) :
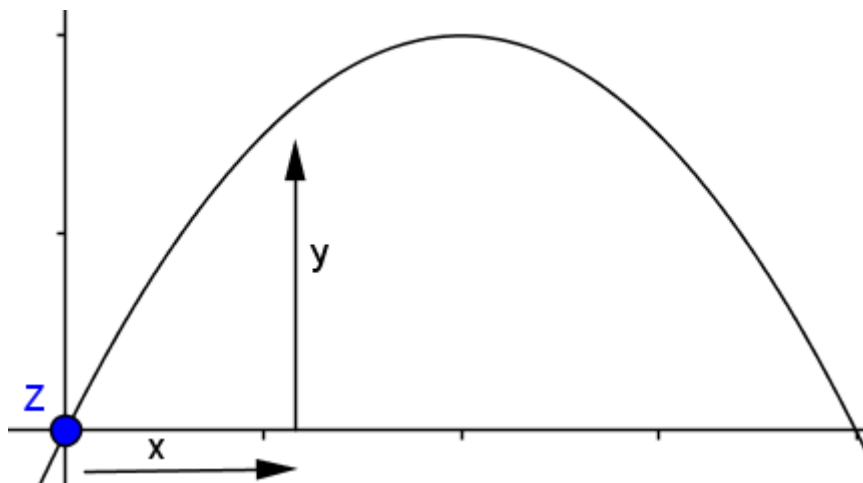
a) What is the maximum height that the ball reaches ? How far from point Z is the ball at that time ?

b) Zoltan wants to lob the goal-keeper who stands 35 m far from point Z.

Arms up, the goal-keeper is 2,50 m high. Explain why he can't catch the ball.

c) After passing the goal-keeper, the ball goes on. How far from point Z will the ball reach the ground ?

d) The goal line is 41 metres far from point Z. As the ball hits the ground, it rolls 2 m further before stopping. Does Zoltan score ? Explain why.

e) How far from point Z could the ball have been caught by a player (except the goal-keeper) if we suppose that the head of a jumping player reaches maximum 2,50 metres high ? Round your answer to the nearest cm.