Work and energy

Answers

Further Maths topic practice

This topic online

Q	Answer	Marks
1	**a)** 489 J **b)** 489 J, since there is no change in kinetic energy (or potential energy), so all the work done by the tension is done against friction	3
2	**a)** 58.8 J **b)** 15.3 m s^{-1}	4
3	28.1 J	4
4	**a)** 7.28 m **b)** P remains at rest, since the maximum friction 7.056 N is greater than the component of the weight down the slope, 6.86 N	7
5	8720 J	5
6	**a)** 339 J **b)** 7.53 m	5
7	**a)** 526 J **b)** 345 J **c)** 4.92 m s^{-1}	7
8	0.263	8
9	**a)** 9.96 m **b)** 8.95 m s^{-1}	8
10	**a)** 2.71 m s^{-1} **b)** 1.5 m; A moves 3 m in total, which is less than 4 m, so it does not reach the pulley	8
11	**a)** 18.9 m s^{-1} **b)** 168 m **c)** Model the air resistance as varying with the speed of the skier (for example proportional to the speed or speed squared) rather than constant	9
12	**a)** 30.2 m s^{-1} **b)** 37.9 m **c)** 23.5 J	9

Full worked solutions, written out by hand, are on the solutions sheet for this topic.

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