

This print-out should have 6 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

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**Tipler PSE5 06 56**

**001** 10.0 points

Water flows over Victoria Falls, which is 128 m high, at an average rate of  $1.34 \times 10^6$  kg/s.

The acceleration of gravity is  $9.81 \text{ m/s}^2$ .

If half the potential energy of this water were converted into electric energy, how much power would be produced by these falls?

Correct answer: 841.306 MW.

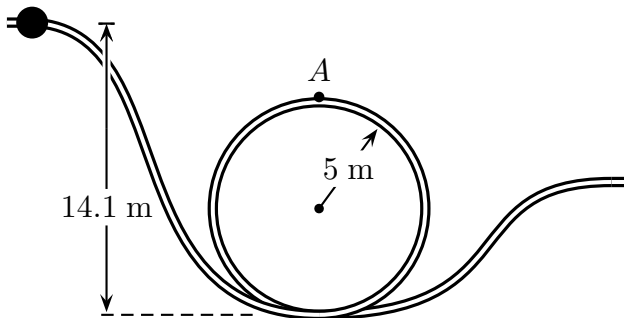
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**Bead on a Loop the Loop 02**

**002** (part 1 of 2) 10.0 points

A bead slides without friction around a loop-the-loop. The bead is released from a height 14.1 m from the bottom of the loop-the-loop which has a radius 5 m.

The acceleration of gravity is  $9.8 \text{ m/s}^2$ .



What is its speed at point A?

Correct answer: 8.96437 m/s.

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**003** (part 2 of 2) 10.0 points

How large is the normal force on it at point A if its mass is 6 g?

Correct answer: 0.037632 N.

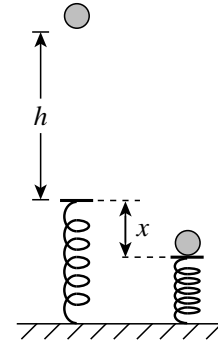
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**Falls on a Spring**

**004** 10.0 points

A(n) 88.3 g ball is dropped from a height of 52.5 cm above a spring of negligible mass. The ball compresses the spring to a maximum displacement of 4.00283 cm.

The acceleration of gravity is  $9.8 \text{ m/s}^2$ .



Calculate the spring force constant  $k$ .

Correct answer: 610.313 N/m.

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**Playground Swing**

**005** (part 1 of 2) 10.0 points

Betty weighs 402 N and she is sitting on a playground swing seat that hangs 0.38 m above the ground. Tom pulls the swing back and releases it when the seat is 0.98 m above the ground.

The acceleration of gravity is  $9.8 \text{ m/s}^2$ .

How fast is Betty moving when the swing passes through its lowest position?

Correct answer: 3.42929 m/s.

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**006** (part 2 of 2) 10.0 points

If Betty moves through the lowest point at 1.5 m/s, what is the magnitude of the work done on the swing by friction?

Correct answer: 195.052 J.