

In the sport of curling, two teams of ‘curlers’ take turns sliding polished granite stones across an ice surface towards a circular target marked on the ice.

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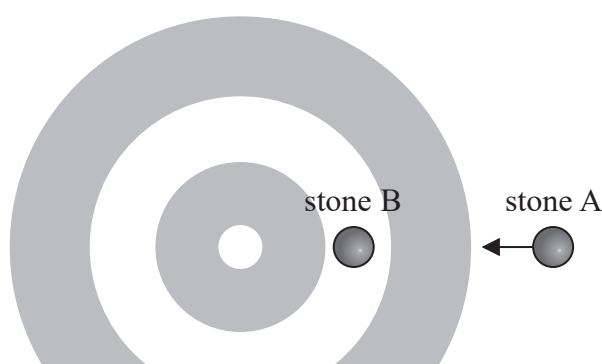
- (a) A stone of mass  $19.6\text{ kg}$  is accelerated uniformly for  $1.25\text{ s}$  before being released by a curler. The stone then decelerates uniformly to rest, travelling  $32.5\text{ m}$  in a time of  $17.5\text{ s}$ .

Calculate the average useful power developed by the curler in accelerating the stone.

(4)

Average power = .....

- \*(b) Stone B is stationary. Stone A travels towards the target and makes a direct hit on stone B as shown. Both stones have mass  $m$ .



The collision is elastic. Just before the collision stone A has a velocity  $v$ . After the collision stone B moves off with velocity  $v$ .

Discuss how the relevant conservation laws apply to this collision.

(6)

- (c) While a stone is moving towards the target, the curlers vigorously sweep the ice directly in front of the stone.

Explain why this may make the stone travel further.

(2)