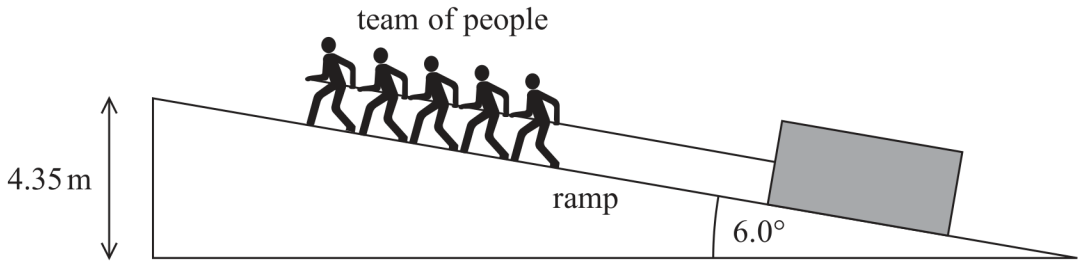
**18** The diagram shows a system used to move a stone block up a ramp. A team of people uses a rope to pull the block at a constant speed.




height of ramp = 4.35 m
angle of ramp to horizontal = 6.0°
mass of block = $2.10 \times 10^3$ kg
speed of block up ramp = 0.450 m s$^{-1}$
total power of team = 6.25 kW

(a) Show that the total force that the team exerts on the block is about 14 kN.

**(2)**

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(b) Determine the total work done by the team.

**(3)**

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Total work done = .....

(c) Show that the useful work done on the block is about 90 kJ.

**(2)**

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(d) Determine the efficiency of the system.

**(2)**

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Efficiency = .....

**(Total for Question 18 = 9 marks)**

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