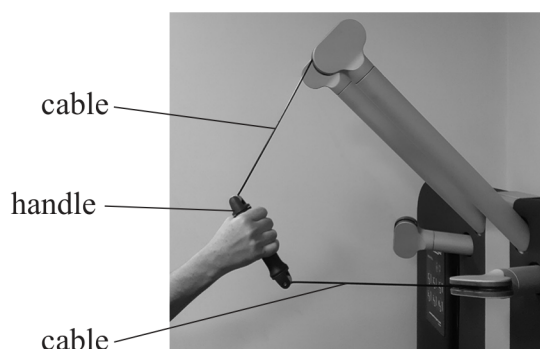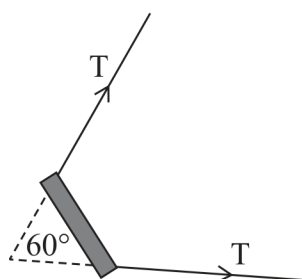**14** A student exercises by lifting weights attached to a machine. The machine has a cable, as shown in the photograph. The cable passes through a handle and is connected to a weight.

There is a tension T in the cable. The angle between the two sides of the cable is 60° as shown in the diagram.

Not to scale

(a) A person keeps the cable stationary by applying a force F of 121 N.

Determine the magnitude of the tension T in the cable using a scaled vector diagram.

(4)

$T =$ ....

(b) The cable is attached to a 150 N weight. Each time the person pulls the handle the weight moves up a vertical distance of 0.25 m. The weight returns to its original position when the handle is released.

The person exercises by pulling and releasing the handle. They do this 90 times in 120 s. The exercise machine displays the average power of the person as 35 W.

Deduce whether the power displayed by the machine is consistent with this data.

(3)

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(Total for Question 14 = 7 marks)