Answer **all** the questions in the spaces provided.

1 **(a)** State the conditions required for a body to be in equilibrium.

.....

.....

.....

..... [2]

(b) A person of weight 700 N hangs at rest from a point on a wire, as shown in Fig. 1.1. The tensions in the wire are T_1 and T_2.

The weights of the wire and of the equipment supporting the person are negligible.

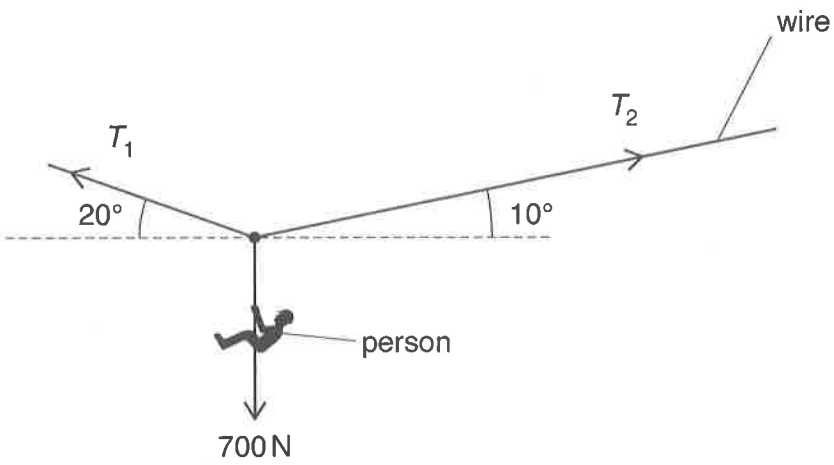

Fig. 1.1

The tension T_1 is at an angle of 20° to the horizontal. The tension T_2 is at an angle of 10° to the horizontal.

Determine the magnitudes of T_1 and T_2.

T_1 = ... N

T_2 = ... N

[4]

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(c) A wire is supported at one end by a vertical pole of height 1.8 m. The base of the pole rests on the surface of solid ground, as shown in Fig. 1.2.

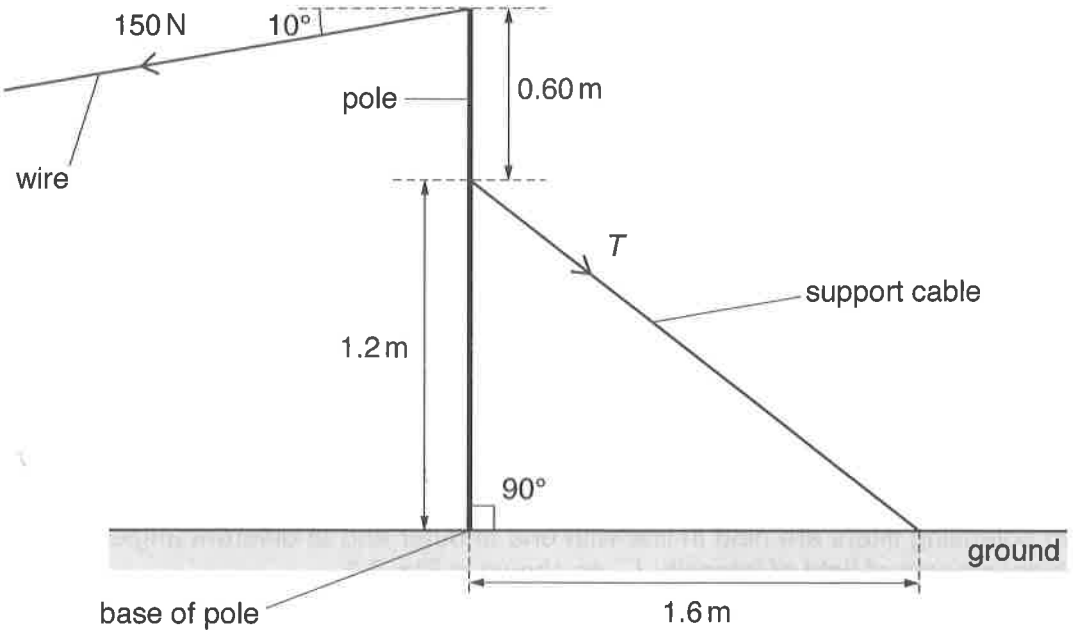

Fig. 1.2

The wire is at an angle of 10° below the horizontal. A cable, attached 1.2 m from the base of the pole, supports the pole. The other end of the cable is attached to the ground at a horizontal distance of 1.6 m from the base of the pole. The tension in the wire is 150 N. The pole is in equilibrium.

Calculate the tension T in the support cable.

T = ... N [3]

[Total: 9]