

1

A street lamp is pulled by a truck using a cable as shown in Fig. 1.1 below.

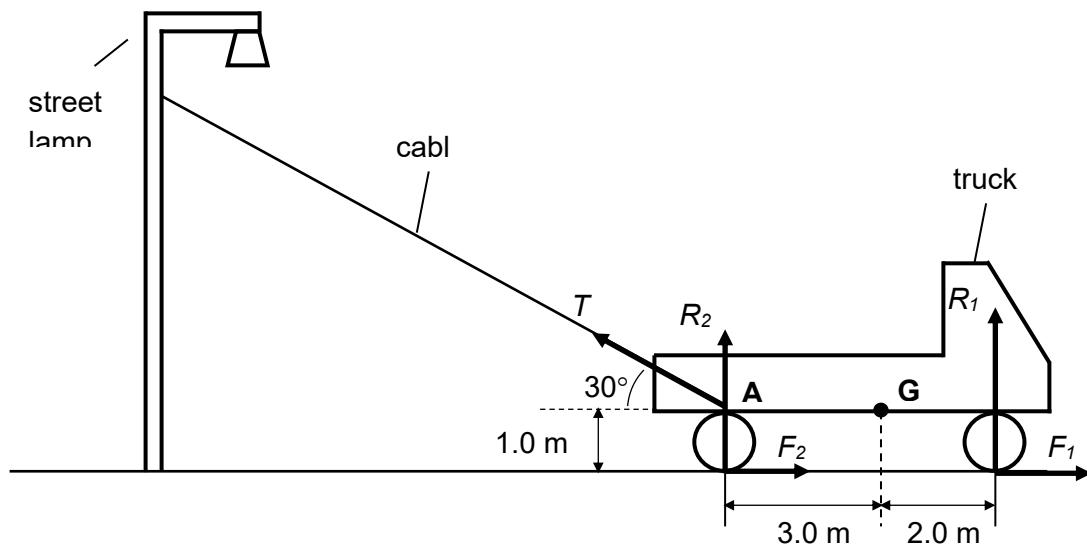


Fig. 1.1 (not to scale)

G is the centre of gravity of the truck which is 1.0 m above the ground. The cable is tied to a point A which is the same height as G and directly above the rear wheel. The truck is in equilibrium and the cable is in tension. The weight W of the truck is 20000 N and the tension T in the cable is 7000 N.

(a)

Explain what is meant by the *centre of gravity* of the truck.

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[1]

(b)

Describe the nature of forces F_1 and F_2 and suggest how they might arise.

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..... [2]

(c)

Determine the normal contact force exerted by the ground on the rear wheels R_2 .

$$R_2 = \dots \text{ N} [3]$$

(d)

Hence, find the normal contact force exerted by the ground on the front wheels R_1 .

$$R_1 = \dots \text{ N} [2]$$