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

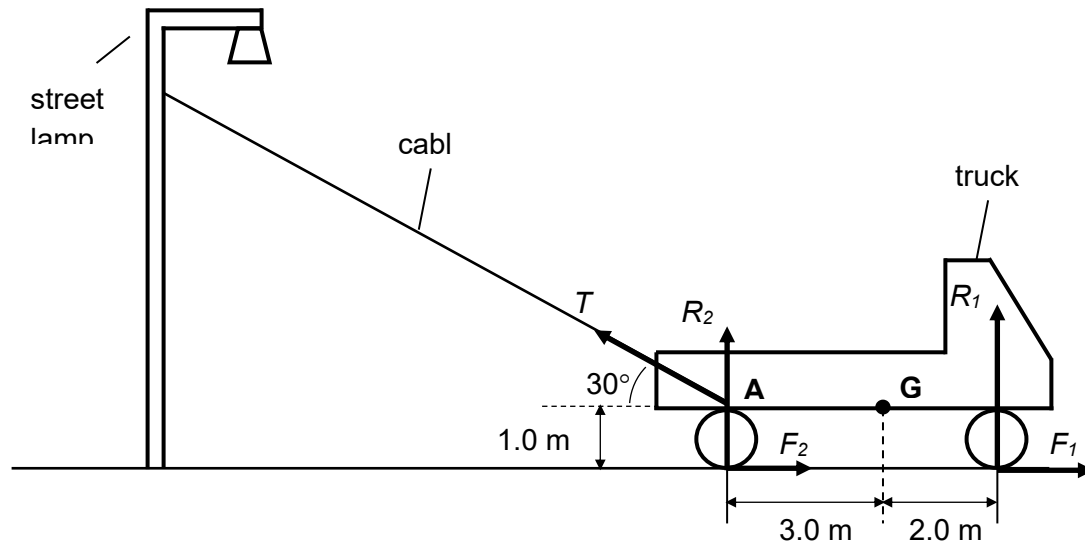


Fig. 1.1 (not to scale)

**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]

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**(b)**

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

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..... [2]

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**(c)**

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

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

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**(d)**

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

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