Momentum – 2019 June

1. 0625/42/M/J/19/No.2

Fig. 2.1 shows a model fire engine. Its brakes are applied.

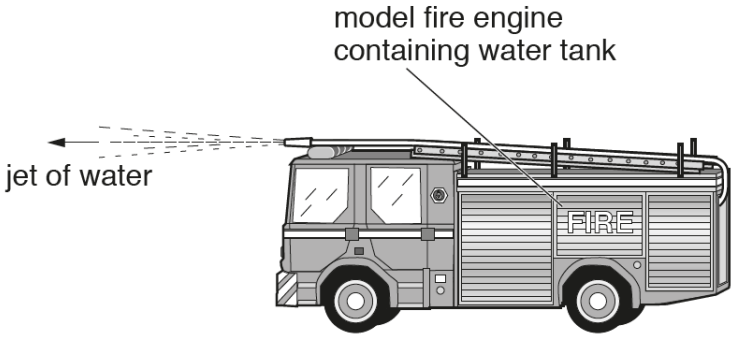

Fig. 2.1

0.80 kg of water is emitted in the jet every 6.0 s at a velocity of 0.72 m / s relative to the model.

(a) Calculate the change in momentum of the water that is ejected in 6.0 s.

momentum = ... [2]

(b) Calculate the magnitude of the force acting on the model because of the jet of water.

force = ... [2]

(c) The brakes of the model are released.

State and explain the direction of the acceleration of the model.

Statement .....

Explanation .....

.....

[2]

(d) In **(c)** the model contains a water tank, which is initially full.

State and explain any change in the magnitude of the initial acceleration if the brakes are first released when the tank is nearly empty.

Statement .....

Explanation .....

.....

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[3]

[Total: 9]