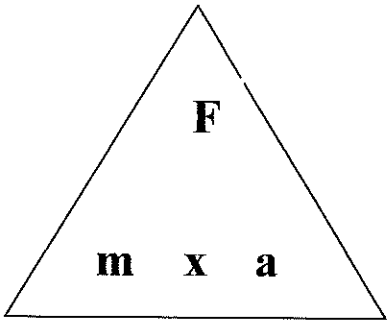
Chapter 8: Resultant Force and F=ma

Remember that F stands for resultant force. This is very important at AS level because you may need to use the resultant force to calculate the size and direction of other forces.

Remember the resultant force just means 'net force' or 'unbalanced force'. It is the resulting effect of all the forces acting on an object.

You should be able to rearrange equations without the need to use a formula triangle but there is no harm in using a triangle.

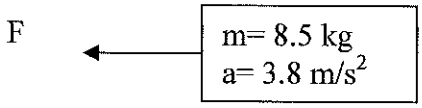
SHOW ALL WORKING



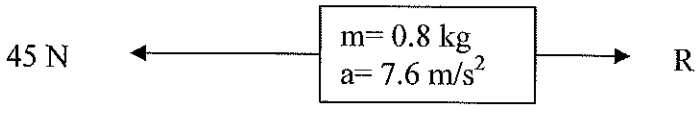
Questions

1. Calculate the resultant force (from the forces shown)

2. Calculate the resultant force (using F=ma)



3. The object below is accelerating to the left. It is being pulled by the 45 N force and a frictional force R also acts.



Firstly calculate the resultant force (using F=ma)

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Now calculate what the frictional force R (show your working)

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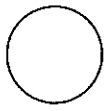
4. A ball hits the ground travelling downwards at 5.0 m/s. The impact with the ground lasts 0.05s. The ball is then moving upwards with a speed of 4.5 m/s.

   a) What was its change of velocity?

   b) What was the magnitude of the acceleration?

   c) If the ball has a mass of 0.25 kg what resultant force was acting on the ball?

   d) Draw a free body force diagram for the ball during the impact, labelling the forces.



   e) (Harder) Given that the Earth's gravitational field strength is **9.81 N/kg** (**not** 10 N/kg) calculate the weight of the ball **and** the push of the ground on the ball.