Do not write outside the box

0 3 **Figure 4** shows two children playing table tennis.

The boy hits the ball from one end of the table.

Figure 4

0 3 . 1 Why does the velocity of the ball change when the boy hits it?

[1 mark]

Tick (✓) **one** box.

The direction of the ball does not change. ☐

There is a resultant force on the ball. ☐

The mass of the ball increases. ☐

The speed of the ball is constant. ☐

Do not write outside the box

0 3 . 2 The ball has an average speed of 11 m/s

The ball takes 0.25 s to travel the same distance as the length of the table.

Calculate the length of the table.

Use the equation:

distance travelled = speed × time

[2 marks]

Length of table = _____ m

Question 3 continues on the next page

Do not write outside the box

0 3 . 3 A table tennis ball should only be used if it bounces to at least 75% of the height it was dropped from.

A manufacturer tested a table tennis ball.

Table 1 shows the results.

Table 1

Height ball was dropped from in cm	Height of bounce in cm
30.0	25.1

Determine whether the ball can be used.

Use the data from **Table 1**.

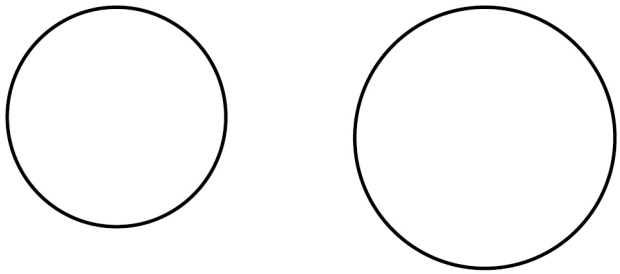
[3 marks]

Do not write outside the box

0 3 . 4 **Figure 5** shows two table tennis balls.

The balls are different sizes but have the same mass.

Figure 5



Both balls were dropped onto the table from the same height.

After they were dropped, the resultant force on the smaller ball was greater than the resultant force on the larger ball.

Explain why.

[2 marks]

8

Turn over for the next question

Question	Answers	Extra information	Mark	AO / Spec. Ref.	ID
03.1	there is a resultant force on the ball		1	AO1 6.5.4.2.1	A
03.2	s = 11 × 0.25 s = 2.75 (m)	an answer of 2.75 scores **2** marks allow 2.8 (m)	1 1	AO2 6.5.4.1.2	E
03.3	$\frac{75}{100} \times 30.0$ 22.5 (cm) (25.1 > 22.5) therefore the ball can be used OR $\frac{25.1}{30.0}$ ×100 (1) 84 % (1) (84% > 75%) therefore the ball can be used (1)	allow any correct method of determining 75% of 30 this mark can only be awarded if a supporting calculation has been done allow any correct supported conclusion allow a conclusion consistent with an incorrect percentage calculation this mark can only be awarded if a supporting calculation has been done allow any correct supported conclusion allow a conclusion consistent with an incorrect percentage calculation	1 1 1	AO3 6.5.4.1.2	E
03.4	the smaller ball has a smaller area (so) air resistance is less (on the smaller ball)		1 1	AO2 6.5.4.2.1	E
Total			**8**		