F=ma/ Resultant Forces
Mark Scheme

Level	IGCSE
Subject	Physics
Exam Board	CIE
Topic	General Physics
Sub-Topic	F=ma / Resultant Forces
Paper Type	Alternative to Practical
Booklet	Mark Scheme

Time Allowed: 32 minutes

Score: /26

Percentage: /100

1 **(a** a_0 = 75.5 (cm) AND b_0 = 25.9 (cm), accept in mm [1]

matching unit [1]

(b) a_1 = 71.(0) AND b_1 = 32.9 [1]

d_A = 4.5 <u>and</u> d_B = 7.(0), allow ecf from earlier results [1]

(c) *M* value rounds to160 (g), allow ecf from **(b)** [1]

2 or 3 sig. figs. and unit: g [1]

(d) appropriate explanation, e.g.
- measure height (from bench)/distance from rule at two places
- line up with rule or suitable horizontal surface
- use of spirit level [1]

(e) repeat with different (sized) loops/different values (of d_A, d_B) [1

any one from:
- (at least) 3 more sets of results and evaluate d_A:d_B
- plot a graph to (check if) a straight line through the origin [1]

[Total: 9]

2 **(a** Table:
correct *d* values
70.0, 60.0, 50.0, 40.0, 30.0, 20.0, 10.0 [1]
cm, N ALLOW m, mm if consistent with figures [1]

(b) **(i)** *d* against *F* (or vice versa) OR distance against force/forcemeter reading
NOT 'extension', 'forcemeter', quantity expressed just as units [1]

(ii) Straight line [1]
Through origin or wtte [1]

(c) Would change forcemeter reading/change mass on rule/wtte [1]

(d) Check distance from bench is the same at two points or wtte/
Line up by eye with windowsill (or suitable horizontal reference) [1]

[Total: 7]

3 **(a** graph: axes labelled and scales suitable [1]
all plots correct to nearest ½ small square [2]
well judged best fit line [1]
thin best fit single line/no 'blobs' [1]

(b) statement matches line (expect YES) [1]
justification matches statement
(expect straight line through origin) [1]

(c) triangle method with more than half the line used [1]
clear how obtained – shown on graph [1]
m correct in kg, 2 or 3 significant figures [1]
1.39 – 1.45 kg - unit penalty

[Total: 10]