

UNIVERSITY OF MALTA JUNIOR COLLEGE

DEPARTMENT OF MATHEMATICS

APPLIED MATHS INTERMEDIATE LEVEL

End-of-Year Exam – ANSWER SHEET – JUNE 2019

1. (a) $\mathbf{m} = \frac{1}{2}(\mathbf{a} + \mathbf{c})$. (b) $\mathbf{n} = 3\mathbf{j}$, $\mathbf{m} = 6\mathbf{i}$.
2. (a) 12.5N, 16.26°. (b) $|\mathbf{G}| = 2|\mathbf{F}|$.
(c) 90. (d) $\mathbf{r} = 2\mathbf{i} + 3\mathbf{j} + \lambda(3.5\mathbf{i} + 12\mathbf{j})$.
3. (b) 2.23m/s².
4. (a) $\frac{125}{3}$ N, $\frac{325}{3}$ N. (b) $\frac{500}{13}$ N, $\frac{1200}{13}$ N.
5. 16.1°, $\frac{\sqrt{3}}{6}$.
6. (b) 4g.
7. (b) (i) 19 125N. (ii) 57 375N.
(c) 0.275m/s².
8. (b) $\frac{3}{25}g$, $\frac{36}{25}mg$. (c) $\frac{36\sqrt{2}}{25}mg$.
9. (a) 692.82N. (b) 49.1° below AB away from wall.
10. (a) 20N, 30N, 10N. (b) 20N, 35N, 15N. (c) 40N, 30N, 10N.