



UNIVERSITY OF MALTA
L-Università ta' Malta
Junior College

Mathematics Department
Intermediate Pure Mathematics End-of-Year Test

June 2016 – Answers

1. (a) $a^4 + 12\sqrt{2}a^3 + 108a^2 + 216\sqrt{2}a + 324$

(b) $\frac{6}{7}$

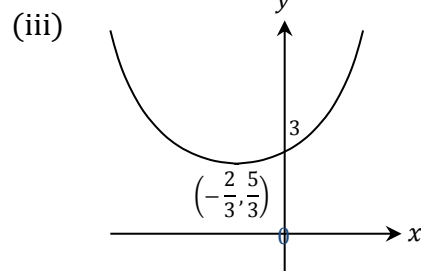
2. (a) (ii) $+\sqrt{15}$

(b) 1.98

3. (a) $2x^2 + x + 2 = 0$

(b) (i) $A = 3; B = \frac{2}{3}; C = \frac{5}{3}$

(ii) $\frac{5}{3}; -\frac{2}{3}$



(iv) $x \in R; f(x) \geq \frac{5}{3}$

4. (ii) $(x + 1)(2x + 3)(2x - 1)$

(iii) $x < -\frac{3}{2}, -1 < x < \frac{1}{2}$

5. (a) $\frac{2}{(2-x)} + \frac{3x-1}{(x^2+1)}$

(b) $-5 \leq x < -2$

6. (i) $M(2, 0)$
(ii) $-\frac{3}{5}$
(iii) $3y = 5x - 10$
(iv) $S\left(\frac{7}{2}, \frac{5}{2}\right)$
(v) $\frac{3\sqrt{34}}{2}$
7. (a) (i) $\frac{2\pi}{3}$
(b) $60^\circ, 90^\circ, 270^\circ, 300^\circ$
8. (a) (i) $x^2(5x \cos 5x + 3 \sin 5x)$
(ii) $\frac{2(3x^2 - 3x - 2)}{(2x - 1)^2}$
(iii) $\frac{-2(x^2 - x - 1)}{(2x - 1)(x^2 + 1)}$
(b) (i) $x^2 + x^{-\frac{1}{2}}$
(ii) $\frac{4x^{\frac{5}{2}} - 1}{2x^{\frac{3}{2}}}$
(iv) $3y = -2x + 8$