

Math 105 TOPICS IN MATHEMATICS
SOLUTION FOR REGULAR HOMEWORK – IV (02/04)

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[I] (9pts) $3^2 = 3 \cdot 3 = 9.$ $2^3 = 2 \cdot 2 \cdot 2 = 8.$ $6^2 = 6 \cdot 6 = 36.$

[II] (6pts) (1) Substitution of $x = 5$ in $(x + 2)^2$ yields

$$(5 + 2)^2 = 7^2 = 49.$$

(2) Substitution of $x = 2$ in $(x + 2)^3$ yields

$$(2 + 2)^3 = 4^3 = 64.$$

[III] (9pts) (a) $(x + y)^2 = x^2 + 2xy + y^2.$

(b) $(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3.$

[IV] (6pts) (1) True or false :

If a, b and c satisfy $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$.

★ The answer is “true”.

(2)

If a, b, c, p, q and r satisfy $p = a + b$, $q = a + c$, $r = b + c$,

then $p^3 + q^3 + r^3 - 3pqr = 2 \left(a^3 + b^3 + c^3 - 3abc \right).$