Quiz - 3

[redacted]

1- Proff:

we assume, n is Postive integer (hypothesis)

Let $n = 2k$ (k is integer)

$\rightarrow$ $n^3 + 2n^2$

$$= (2k)^3 + 2(2k)^2$$

$$= 8k^3 + 2(4k^2)$$

$$= 8k^3 + 8k^2$$

$$= 2(4k^3 + 4k^2)$$

$$= 2(x) \quad \text{where } x = 4k^3 + 4k^2$$

$$n^3 + 2n^2 = 2x$$

<u>conclusion:</u>

$\rightarrow$ If n is ~~Postive~~ even integer ~~then~~
then $n^3 + 2n^2$ is also even integer.

2- Proof

If $x^2 \geq 9$, then show $|x| \geq 3$

lets suppose $|x| < 3$ on the other hand

then either $x < 3$ or $x > -3$

If $x < 3$ then $x^2 < 9$

If $x > -3$ then $x^2 < 9$

So If $x < 3$ or $x > -3$ then still we have $x^2 < 9$

So in both cases, we have contradiction, Hence $|x| \geq 3$

So its proved that If $x^2 \geq 9$ then $|x| \geq 3$

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Proof

let's assume the conclusion, statement is false

If $x^3+4x^2+6x+24=0$ then $x=-4$ is false.

let's assume $x \neq 4$

then:

$$x^3+4x^2+6x+24$$

$$x^2(x+4)+6(x+4)$$

$$(x^2+6)(x+4)$$

So, $(x^2+6)(x+4) \neq 0$

We have proved that

If x is a real number and statement is equal to zero.

If $x^3+4x^2+6x+24=0$

then $x=-4$

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