A maths (mathematical) proof

Made by Edward J, an unproven theorem, a.k.a. conjecture.

Statement: the differences between consecutive square numbers increase by 2.

Demonstration:

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$12^2 = 144, 13^2 = 169, 14^2 = 196$

$169 - 144 = 25$

$196 - 169 = 27$

$27 - 25 = (+)\ 2$
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The differences have increased by 2.

Proof (steps, by deduction):

I can write any pair of consecutive square numbers as n^2, $(n+1)^2$ and the next pair as $(n+1)^2$, $(n+2)^2$. This makes a sequence n^2, $(n+1)^2$, $(n+2)^2$. Then:

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$a = (n+1)^2 - n^2$

$= (\ (1)n^2 1^{\circ} + (2)n^1 1^1 + (1)1^2 n^{\circ}\ ) - n^2$ [expand brackets]

$= (\ n^2 + 2n + 1^2\ ) - n^2$ [simplify]

$= 2n + 1$ [simplify]

$b = (n+2)^2 - (n+1)^2$

$= (\ (1)n^2 2^{\circ} + (2)n^1 2^1 + (1)2^2 n^{\circ}\ ) - (\ (1)n^2 1^{\circ} + (2)n^1 1^1 + (1)1^2 n^{\circ}\ )$
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[expand 1st brackets]

$= (n^2 + 4n + 2^2) - (n^2 + 2n + 1^2)$ [simplify]

$= 2n + 3$ [simplify]

$b - a = (+)\ 2$

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So the differences of any pair of consecutive square numbers

minus the difference of the previous pair is an increase of 2.

Quod Erat Demonstrandum [thus it has been demonstrated]

(I think, could need more proof maybe, also

informally: Quod sic probat = that proves it).

(end statement:) So the differences between (pairs of) consecutive square numbers increase by 2.

*- this was voluntary college homework done before a weekend.*
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