Extra Puzzles

What is the value of

$$\frac{\frac{(5^2-3^2)}{5+3}+\frac{(4^2-2^2)}{4+2}+\frac{(3^2-1^2)}{3+1}}{2}\ ?$$

Did you notice the difference of two squares?

$$\frac{\frac{(5^2-3^2)}{5+3}+\frac{(4^2-2^2)}{4+2}+\frac{(3^2-1^2)}{3+1}}{2}$$

Extra Puzzles

What is the value of

$$\frac{\frac{(5^2-3^2)}{5+3}+\frac{(4^2-2^2)}{4+2}+\frac{(3^2-1^2)}{3+1}}{2}\ ?$$

Using the difference of two squares.

$$=\frac{\frac{(5+3)(5-3)}{5+3}+\frac{(4+2)(4-2)}{4+2}+\frac{(3+1)(3-1)}{3+1}}{2}$$

$$=\frac{(5-3)+(4-2)+(3-1)}{2}$$

$$=\frac{2+2+2}{2}=\frac{6}{2}=3$$

Extra Puzzles

Given that

$$55^2 - 45^2 = (55 + 45)(55 - 45) = 1000$$

and

$$60^2 - 40^2 = (60 + 40)(60 - 40) = 2000$$

Find numbers a and b such that $a^2 - b^2 = 3000$

Find numbers c and d such that $c^2 - d^2 = 4000$

Find numbers e and f such that $e^2 - f^2 = 100\,000$

Extra Puzzles

Given that

$$55^2 - 45^2 = (55 + 45)(55 - 45) = 1000$$

and

$$60^2 - 40^2 = (60 + 40)(60 - 40) = 2000$$

Are these the only possible solutions?

Find numbers a and b such that $a^2 - b^2 = 3000$

$$65^2 - 35^2 = (65 + 35)(65 - 35) = 3000$$

Find numbers c and d such that $c^2 - d^2 = 4000$

$$70^2 - 30^2 = (70 + 30)(70 - 30) = 4000$$

Find numbers e and f such that $e^2 - f^2 = 100\,000$

$$550^2 - 450^2 = (550 + 450)(550 - 450) = 100\,000$$