8/9/21

Maths

1) Without actual Multiplication:
$(103)^2$
= (10,609) actual value.

2) Factorise the following

$16m^2 - 9n^2$
$= 16m^2 - 9n^2$
$= 206m - 81n$
$= 125mn$

3) $(3x+4y)^2 = (3x)^2 + 2\times3x\times4y + (4y)^2$
$= 9x^2 + 24xy + 16$

4) $\left[\frac{x}{2} - \frac{y}{3}\right]^2$
$= \left(\frac{x}{2}\right)^2 + 2\times\frac{x}{2}\times\frac{y}{3} + \left(\frac{y}{3}\right)^2$
$= \frac{x}{4} + \frac{2xy}{5} + \frac{y}{6}$

5) $(a^2b - b^2a)^2$
$= [ab(a-b)]^2$
$= (ab)^2(a-b)^2$
$= (ab)^2(a^2 - 2ab + b^2)$
$= a^2b^2(a^2 - 2ab + b^2)$
$= a^4b^2 - 2a^3b^3 + a^2b^4$

6) $(1.5x^2 - 0.3y^2)(1.5x^2 + 0.3y^2)$

$(a-b)(a+b) = a^2 + b^2$

$(1.5x^2)^2 - (0.3y^2)^2$
$2.25x^4 - 0.09y^4$

7. $9x^2 + 25y^2 = 181$

$xy = -6$

$(3x+5y)^2 = 9x^2 + 25y^2 + 2 \times 3x \times 5y$

$= 9x^2 + 25y^2 + 30xy$

$= 181 + 30(-6)$

$= 181 - 180$

$= 1$

8) Evaluate the ---------- 104×96

$= 104 \times 96$

$= (100+4)(100-4)$

$(x+y)(x-y) = x^2 - y^2$

$x = 100, \; y = 4$

$= (100)^2 - (4)^2$

$= 10000 - 16$

$= 9984$

9) $(997)^2$

$= (1000 - 3)^2$

$= (1000)^2 + 3^2 - 2(1000) \times 3$

$= 1000000 + 9 - 6000$

$= 994,009$

10) 103×107

$= (100+3)(100+7)$

$(x+a)(x+b) = x^2 + (a+b)x + ab$

$x = 100, \; a = 3, \; b = 7$

$= (100)^2 + (3+7)100 + (3)(7)$

$= 10000 + (10)(100) + 21$

$= 10000 + 1000 + 21$

$= 11021$

12) Evaluate using identities

2.07×1.93

$= (2 + .07)(2 - .07)$

$= 2^2 - .07^2$

$= 4 - .0049$

$= 3.9951$