Answer on Question #53827 – Math – Algebra

Some problems require you to factor out the GCF before you can use the difference of two squares formula. The factors would then have the form: GCF(a-b)(a+b).

Factor completely: $8x^2 - 2y^2$.

Solution

$$8x^2 - 2y^2 = 2(4x^2 - y^2) = 2(2x - y)(2x + y). \quad (1)$$

Here the following formula was applied:

$$a^2 - b^2 = (a - b)(a + b). \quad (2)$$

Formula (2) is true, because

$$(a - b)(a + b) = a \cdot a + a \cdot b - b \cdot a - b \cdot b = (a \cdot a - b \cdot b) + (a \cdot b - b \cdot a) =$$

$$= a^2 - b^2 + 0 = a^2 - b^2.$$

Next, let $a = 2x$, $b = y$ and using (2) obtain (1).

Answer: $8x^2 - 2y^2 = 2(2x - y)(2x + y)$.