

NUMBER SENSE TIPS (FEBRUARY 2019)

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1. Find the hypotenuse of a right triangle with legs 12 and 16. _____.

Step #1 : Divide legs by their GCD.

$$12 \div 4 \text{ and } 16 \div 4$$

3 and 4

Step #2 : Find the Pythagorean triplet.

3, 4, 5

Step #3 : Hypotenuse is 5 multiplied by the GCD.

$$5(4) = 20$$

Recommend you memorize the following Pythagorean Triplets.

3, 4, 5

5, 12, 13

7, 24, 25

9, 40, 41

11, 60, 61

13, 84, 85

8, 15, 17

2. 48 has how many positive integral divisors? _____.

Step #1 : Prime factor the number.

$$2^4 \times 3^1$$

Step #2 : Add 1 to each exponent and multiply.

$$(4 + 1)(1 + 1) = (5)(2) = 10$$

3. How many distinct diagonals can be drawn in a 20-sided polygon? _____.

Rule : $n(n - 3)/2$

Solution : $20(20 - 3)/2 = 10(17) = 170$

4. The sum of the 5th and 6th triangular numbers is _____.

If the numbers are consecutive, find the square of the larger number. $6^2 = 36$

5. If $2 + 4 + 6 + \dots + k = 95 \times 96$, then $k =$ _____.

$$k(k + 2)/4 = 95 \times 96$$

$$k(k + 2) = 4 \times 95 \times 96$$

$$k(k + 2) = 2 \times 95 \times 2 \times 96$$

$$k(k + 2) = 190 \times 192 \text{ and } k = 190$$