

NUMBER SENSE TIPS (JANUARY 2021)

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1. $8928 = 93 \times \underline{\hspace{2cm}}$.

This is the shortcut for multiplying numbers close to 100.

$$\text{Step \#1 : } (100 - 93)(100 - ?) = 28$$

$$7(100 - ?) = 28$$

$$100 - ? = 4 \quad ; \quad ? = 96$$

2. Estimate : $48731 \div 213 = \underline{\hspace{2cm}}$.

$49000 \div 210$; Temporarily disregard the zeroes.

$$49/21 = 7/3 = 2.33\dots$$

When 48731 is divided by 213, the answer should have 3 digits. Thus, answer is 233.

$$\text{Range : } 218 - 240$$

3. $\frac{5!+7!}{6!} = \underline{\hspace{2cm}}$.

$$\frac{5!}{6!} + \frac{7!}{6!} = \frac{1}{6} + 7 = 7 \frac{1}{6}$$

4. If $x^2 = 50$, then $(3x - 4)(3x + 4) = \underline{\hspace{2cm}}$.

$$(3x - 4)(3x + 4) = 9x^2 - 16$$

$$9(50) - 16 = 450 - 16 = 434$$

5. How many triangles can be drawn from a given vertex of an n-gon?

Rule : ${}_{n-1}C_2$

Example A : How many triangles can be drawn from a given vertex of a septagon?

$${}_{7-1}C_2 = {}_6C_2 = \frac{6!}{4!2!} = \frac{(6)(5)}{2} = 15$$

The number of triangles that can be drawn from each vertex are the triangular numbers. The only triangular number NOT included is 1. Thus, to determine how many triangle can be drawn from the vertex of an n-gon simply find the (n - 2)th triangular number.

Example A : How many triangles can be drawn from a given vertex of a octagon?

Find the (8 - 2)th triangular number. The 6th triangular number is $\frac{(6)(7)}{2} = 21$.