

## NUMBER SENSE TIPS (OCTOBER 2020)

Leo Ramirez Sr. (The Wizard Maker)

www.rammaterials.com

For more teaching tips, visit the STORE and look for instructional Number Sense workbooks.

1. Estimate:  $165 \times 279 \div 3 =$  \_\_\_\_\_.

$$165 \div 3 \times 279 = 55 \times 279 \text{ which about } 55 \times 280.$$

Use the double and half shortcut to get  $110 \times 140$ .

Use the multiplying by 11 shortcut to get 15,400.

Range:  $14,578 - 16,112$

2. The sum of the coefficients of  $(4x - 6)^2$  is \_\_\_\_\_.

Disregard the variable and simplify.

$$(4 - 6)^2 = (-2)^2 = 4$$

3. Estimate: The volume of a right circular cylinder with radius 6 and height 40 is \_\_\_\_\_.

$$\text{Volume} = \pi r^2 h = \pi(6)^2(40) = (36)(40)\pi = 1440\pi$$

Approximate:  $1440(3.14) = 1440(3 + .14)$

$$1440(3) + 1440(.14)$$

$$4320 + 196 = 4516$$

Range:  $4298 - 4750$

4. If  $x^2 + 9x - 22 = (x - p)(x - q)$ , then  $pq + p + q =$  \_\_\_\_\_.

$pq$  is the product of the roots and  $p + q$  is the sum of the roots.

The product of the roots and sum of the roots of

$$ax^2 + bx + c = 0 \text{ are } c/a \text{ and } -b/a.$$

$$c/a + (-b/a) = (c - b)/a = (-22 - 9)/1 = -31$$

5. Estimate:  $18 \times 20 \times 22 \times 24 = \underline{\hspace{2cm}}$ .

Square the product of the numbers in the middle or the numbers on the outside.

$$(20 \times 22)^2 = 440^2 = 193600 \text{ (I used shortcut for squaring numbers close to 50 when squaring 44).}$$

$$\text{Range: } 180,576 - 210,672$$

Be aware of the following variation.

Estimate:  $23 \times 24 \times 25 \times 26 = \underline{\hspace{2cm}}$ .

Square the product of the numbers in the middle or the numbers on the outside.

$$(24 \times 25)^2 = 600^2 = 360,000$$

$$\text{Range: } 340,860 - 376,740$$