Name: _Key_       Date: _June 9, 2015_

1. If you guess at 10 true-false questions, how many different ways can you fill in the ten answers? **Show your reasoning!**

1    2    3    4    5    6    7    8    9    10
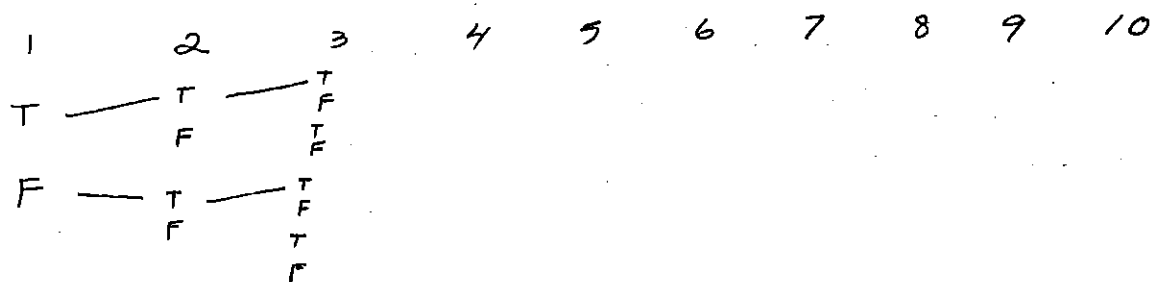


$2 \to T$ or $F$, 10 slots (questions) $= n$

$2^n = 2^{10} = 1024$ ways

2. Decide whether the two sequences of operation will give the same results: *adding two numbers x and y, then dividing the result by 3 or dividing x and y by 3, then adding the results.* **Show your work!**

$$\frac{x+y}{3} \overset{?}{=} \frac{x}{3} + \frac{y}{3}$$

Common

$$= \frac{x+y}{3}$$

yes, the same.

3. To celebrate Dunder Mifflin's 40<sup>th</sup> anniversary, Dwight has made a 40-foot-long sandwich. The sandwich is cut into three **unequal** pieces. The longest piece is three times as long as the middle piece, and the shortest piece is 5 feet shorter than the middle piece. What are the lengths of the three pieces? **It is important to use your *four problem-solving steps* and to show your process for solving the problem.**

Short Piece: $x - 5 = 9 - 5 = 4$ feet

Middle Piece: $x$ feet $= 9$ feet

Long Piece: $3x = 3(9) = 27$ feet

$(x - 5) + x + 3x = 40$

$x + x + 3x = 45$

$5x = 45$

$x = 9$

| $x - 5$ | $x$ | $3x$ | $= 40$ feet |
|---------|-----|------|-------------|
| $9 - 5 = 4$ | $9$ | $3(9) = 27$ | |

Check

$4 + 9 + 27 = 40$

$13 + 27 =$

$40 = 40$ ✓