# PERENNIAL MATH

## November 2014 Intermediate Level

TEST # 1

1) In this multiplication problem, the stars stand for the same digit. What is the largest possible three-digit product?
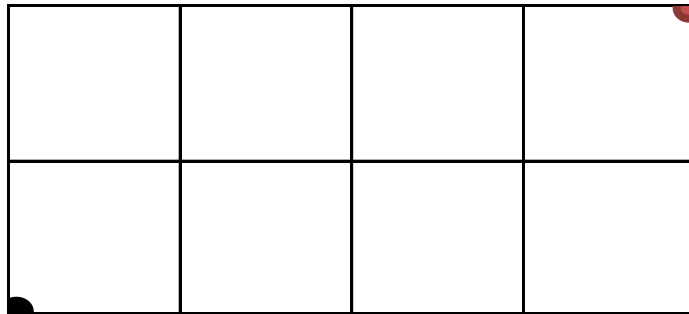
$$\begin{array}{r} \star\,\star \\ \times\quad\star \\ \hline \underline{\phantom{0}}\ \underline{\phantom{0}}\ \star \end{array}$$

2) Mary is 11 years old. Next year she will be three times as old as her brother will be. How many years from now will she be twice as old as her brother will be then?

3) Billy is playing in a single elimination tennis tournament which means once a player loses he or she must go home. If there are 32 players, how many games will he have to win in order to be the champion?

4) Four girls ran for homecoming queen. Lori got 60% of the votes, Mattie got 25%, Kendra got 10% and Sonya got the remaining 45 votes. How many total votes were cast altogether?

5) If you start at the bottom left point and go to the top right point, how many paths along the lines can you draw? You may only travel up or right at any time. You may not move down or left.

6) Farmer Joe counted the horses and chickens in his barn. He counted 19 heads and 50 feet. How many chickens were in the barn?

# PERENNIAL MATH

## TEST # 1

## November 2014 Intermediate Level Answers

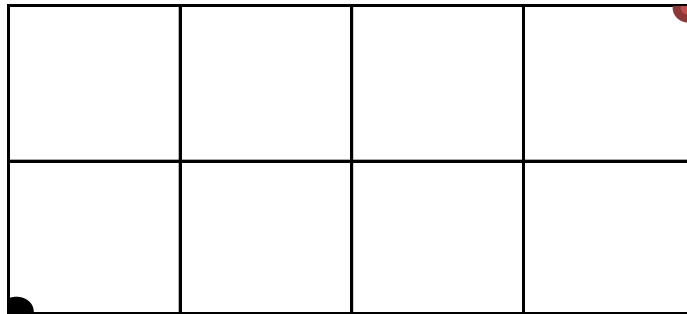| | |
|---|---|
| 1) In this multiplication problem, the stars stand for the same digit. What is the largest possible three-digit product? | **396** |
| 2) Mary is 11 years old. Next year she will be three times as old as her brother will be. How many years from now will she be twice as old as her brother will be then? | **5** |
| 3) Billy is playing in a single elimination tennis tournament which means once a player loses he or she must go home. If there are 32 players, how many games will he have to win in order to be the champion? | **5** |
| 4) Four girls ran for homecoming queen. Lori got 60% of the votes, Mattie got 25%, Kendra got 10% and Sonya got the remaining 45 votes. How many total votes were cast altogether? | **900** |
| 5) If you start at the bottom left point and go to the top right point, how many paths along the lines can you draw? You may only travel up or right at any time. You may not move down or left. | **15** |
| 6) Farmer Joe counted the horses and chickens in his barn. He counted 19 heads and 50 feet. How many chickens were in the barn? | **13** |

*We are only providing some suggested solutions below- There are always multiple methods to solve problems.*

**1) Since the star stands for the same digit, the star times star equals star. The only digits that are capable of this are 0, 1, 5 and 6. Six is the largest, so 66 x 6 = 396. That is the largest product you can make.**

**396**

**2) If Mary is 11 now, then next year she will be 12. Next year she will be three times as old as her brother, so he will be 4 next year. Make a chart to see the ages until you notice when she is twice as old as her brother. In 5 years she will be 16 and he will be 8.**

|  | Now | in 1 year | in 2 years | in 3 years | in 4 years | in 5 years |
|---|---|---|---|---|---|---|
| **Mary's age** | 11 | 12 | 13 | 14 | 15 | 16 |
| **Brother's age** | 3 | 4 | 5 | 6 | 7 | 8 |

**5**

**3) Make a tree diagram so you can see the tournament bracket. Starting with 32 players we go to 16 player, 8 player, 4 players, 2 players and then the winner is left. The winner must play 5 games overall.**

**32 Team Single Elimination**

Game1 Game2 Game3 Game4 Game5 Winner

**5**

**4) Method 1:** If you add up the percentages of three girls you have 60 + 25 + 10 = 95%. This leaves Sonya receiving the remaining 5% of votes which is 45 votes. If 45 votes is 5%, then 10% is 90 votes. So 100% is ten times this amount or 900 votes.

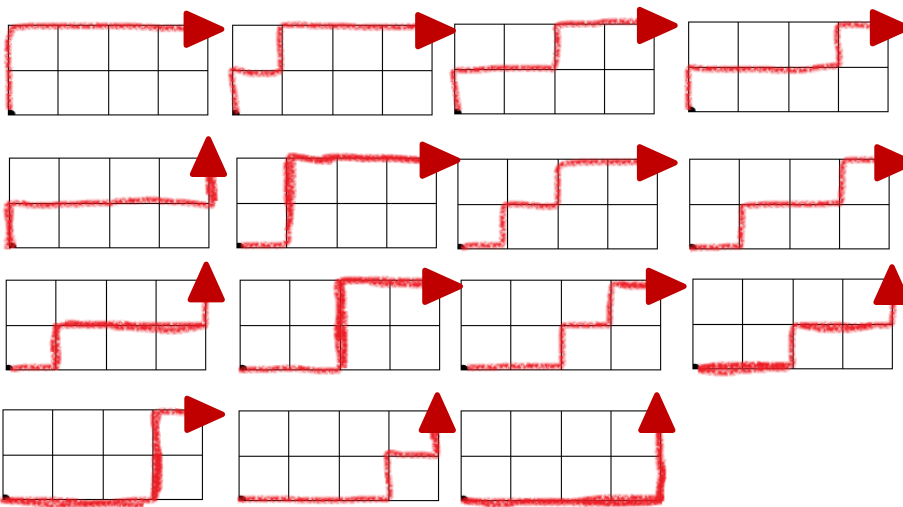**Method 2:** Use algebra. Since Sonya has 5% of the total, let X represent the total.

$$.05 X = 45$$
$$X = 45 / .05$$
$$X = 900$$

**900**

**5)**



**15**

**6)** Make a table and see the relationship of animals and feet. Notice that with each decrease in horses, you lose 2 feet. There are 13 chickens in the barn.

Decreases by 1

| Chickens | 10 | 11 | 12 | 13 |
|---|---|---|---|---|
| Horses | 9 | 8 | 7 | 6 |
| Total heads | 19 | 19 | 19 | 19 |
| Total feet | 56 | 54 | 52 | **50** |

Decreases by 2

**13**