ANSWERS

A) _____   D) _____

B) _____   E) _____

C) _____   F) _____

A) In a plane, the locus of a curve is defined by the parametric equations

$$x = 9\sec(t) \text{ and } y = 7\tan(t), \text{ where } 90° < t < 180°$$

Express x directly as a simplified function of y.

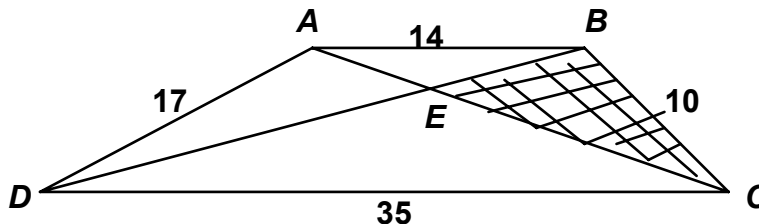B) Determine <u>all</u> ordered pairs (x, y) of positive integers, where

$$x > y \text{ and } x^3 - x^2y - xy^2 + y^3 = 1024.$$

C) Determine the <u>sum</u> of all values of x over $[0, 360°)$ for which

$$\cot^2(270° - 2x) - \csc(90° + 2x) - 1 = 0$$

D) Determine <u>all</u> ordered pairs of integers (n, x) for which $n > 3$ and $\displaystyle\sum_{k=3}^{k=n}(xk + 3) = 45$.

E) In trapezoid $ABCD$ (with bases $\overline{AB}$ and $\overline{CD}$), $AB = 14$, $BC = 10$, $CD = 35$ and $AD = 17$. <u>Compute</u> the area of $\triangle BEC$.

F) Let a, b and c be positive integers and a and b be consecutive.
If $a + b + c = 21$, determine the sum of all distinct products abc.