January Algebra One TEAM Questions
Condensed Version

Question #1:

A : Give the product of the x and y intercepts (the non-zero portion) for the graph of the equation $3x+4y=9$ as a fraction in simplest form.

B : Give the absolute value of the difference of the x and y intercepts (the non-zero portion) for the graph of the equation $-5y+4x=10$.

C: Give the sum of the x and y intercepts (the non-zero portion) for the graph of the equation $3x+7y=21$.

D: Give the quotient of the x and y intercepts (the non-zero portion) for the graph of the equation $-2y-2x=4$, so that $D\geq 1$. If this is not possible, then let D=100.

Question #2:

The integers A, B and C are distinct, and each number of the sequence A, B, C differs from their adjacent number by 5. The largest number is A. The sum of A, B and C is 7053.

A = the value of integer A.
B = the value of integer B.
C = the value of integer C.

D is the number of positive integer factors of 7056.

Question #3:

The value of A is 20% of the value of P, which is 40% of the value of B, which is 50% of the value of C. P=10.

A = the value of A.
B = the value of B.
C = the value of C.

D = the smallest positive integer possible that when divided by 2, 4, or 7 yields a remainder of 1.

Question #4:

Consider x- and y- intercepts as numbers, and not as ordered pairs.

A = the greatest x-intercept of the graph of $y=x^2-9x+14$.

B = the least x-intercept of the graph of $y=x^2-9x+14$.

C = $p+q$ if the graph of $y=x^2+px+q$ has x-intercepts -10 and 12.

D = $\frac{m}{n}$ if the graph of $y=x^2+mx+n$ has exactly one x-intercept, and a y-intercept that is one-third of its x-intercept. ($mn\neq 0$)

Question #5:

A: For the equation of the line that passes through (3,4) and (-9,12) in standard form, and the coefficients of the x and y terms have no common factors greater than 1, let A equal the coefficient of the x term.

B: For the equation of the line that is perpendicular to (3,4) and (-9,12) and passes through (0,0), in standard form, and the coefficients of the x and y terms have no common factors greater than 1, let B equal the coefficient of the y term.

C: If the slope of a line is undefined, let C equal the slope of the line that is perpendicular to it.

D = $p+q$ if the lines with equations $3x-2y=12-2y$ and $\frac{y}{3}=-12$ intersect at point (p,q).

Question #6: **Consider x- and y- intercepts as numbers, and not as an ordered pair.**

A: The line with equation $Ax+y=8$ contains the point $(2,-6)$. If this is not possible, let A=5, otherwise give the value of A.

B: "If the absolute value of the x and y intercepts of two lines are the same, then they are the same line." If this statement is true, let B=8. If false, B=6.

C: "Line 1 is perpendicular to Line 2 and to Line 3. Line 3 is parallel to Line 4, which intersects with Line 5 at the origin. Line 6 is perpendicular to Line 2 which is parallel to Line 7. Line 7 is parallel to Line 3." ALL lines lie in the same plane. If this situation is possible, let C=12. If this situation is NOT possible, C=4.

D: When the equation $4x-3y=-15$ is written in slope-intercept form, then D is the coefficient of the x term. Write D as a fraction in simplest form.

Question #7:

If x is a positive integer, then define $x!=x(x-1)(x-2)(x-3)...(1)$.
For example, 6! = 6•5•4•3•2•1 = 720

A = $4!+3!$

B = $\frac{10!}{8!}$

C: Simplify $\frac{(x+1)!}{x!}$ for $x>0$. Your answer is an expression with x.

D: Simplify $\frac{(x-2)!(x+3)!}{(x-1)!(x+2)!}$ for $x>2$. Your answer is an expression with x.

Question #8:

Consider the intersection of the linear equations $3x+5y=27$ and $-5x+2y=-14$ to be the point $P(m,\ n)$.

A = the value of the product mn.
B = the value of the sum $m+n$.
C = the distance between P and the origin.
D sq. units = the area of a square with side length C, found in part C above.

Question #9.

Consider the following statements for the answer to parts A, B, C and D below.

E = All integers are rational.
F = All prime numbers are odd.
G = A line whose x- and y- intercepts are both odd positive integers can have slope of 2.
H = Two lines are parallel if their slopes are the same and their y-intercepts are different.
J = Two lines are perpendicular if their slopes are the additive inverse of each other.
K = If an integer is rational, then its square root is sometimes rational.
L = The lines with equations $x=3$ and $y=4$ are parallel to the y and x axis, respectively.
M = Any line that is never in the first quadrant, nor has a zero or undefined slope, must have a negative slope.
N = Two odd whole numbers have a sum that must be even.

A = the number of statements in the statements E through N which are true. A is a number.
B = the list of statements above which are false. B is a list of letters, in alphabetical order.
C: **If exactly three statements above are true** (this may or may not be correct), then how many true statements must be added to the list above so that 40% of the total statements are true? C= the number of true statements that must be added, given the hypothesis in **bold**.
D: **If exactly five statements above are true** (this may or may not be correct), then how many true statements must be added to the list above so that 80% of the total statements are true? D= the number of true statements that must be added, given the hypothesis in **bold**.

Question #10:

A = $\dfrac{43+25-6(3+16)}{2^4-8\left(\dfrac{14}{6+2}\right)}$ B = $18-22\left(\dfrac{55}{11-6}\right)$

C = $\dfrac{4^3}{2^8}(15-7)\left(\dfrac{1}{2}\right)-(18-19)$ D = $3^3-\sqrt{2^3-(-1)^3}$

Question #11:

Given: $7x=\dfrac{1}{5y}$

A = $\dfrac{70}{xy}$

B = $\left(\dfrac{1}{xy}-xy\right)^2-x^2y^2$

C = an expression in terms of x for $\dfrac{35}{y}$

D = the value of $(x+y)^2-(x+y)(x-y)-2y^2$

Question #12:

A = the least value of x which is a solution of $|2x-6|+5=7$.

B = the least integer value in the solution set of $|x-8|<12$.

C = p if the solution set of $|x+p|<10$ is $\{-8,-7,-6,...,8,\ 9,\ 10\}$, when solved over the set of Integers, and p is an integer.

D: The distance on the number line between 4 and a number n is 6. Give all of the possible values of n.

Question #13:

Let A be the least positive integer value possible so that $\frac{360A}{200}$ is a positive integer.

Let B be the greatest common factor of 360 and 200.

Let C be the total number of positive integers less than 1000 (and greater than 15) that are divisible by both 12 and 15.

Let D be the least common multiple of 360 and 200. (Your answer is a positive integer greater than both 360 and 200.)

Question #14:

Consider points P(2, 5) and Q(8, 13). Point R is $\frac{4}{5}$ of the distance from P to Q.

A = the x-coordinate of point R in decimal form.
B = the y-coordinate of point R in decimal form.
C = the x-coordinate of point T, so that Q is the midpoint of segment $\overline{PT}$.
D = the x-coordinate of point S, so that P is the midpoint of segment $\overline{SQ}$.