Algebra I Team Questions January

1. In 2 weeks, 550 cartons of juice were sold in the school cafeteria. At this rate, how many cartons of juice would one expect to be sold in 5 weeks?

2. For what integer value of x is $3x + 5 > 11$ and $x - 3 < 1$?

3. The average (arithmetic mean) of 4 numbers is greater than 7 and less than 11. What is the least possible integer that could be the sum of these 4 numbers?

4. If $5(x + y) = \frac{1}{2}$ and $\frac{c + d}{4} = \frac{3}{2}$ and $\frac{5(e + f)^2}{3} = 60$;

   what is the value of $\frac{x + y}{2} + 4(c + d) - \left|\frac{e + f}{3}\right|$?

5. How many pounds of a dried fruit mix costing \$3.00 per pound must be mixed with 8 pounds of a nut mixture costing \$4.50 per pound to give a fruit-nut mixture costing \$4.00 per pound?

6. In an election for class president, Maria finished first, Kevin second, Carlos third, and Diane fourth. Maria received 91 votes and Diane received 32 votes. If a total of 224 votes were cast for these four candidates, what is the minimum number of votes that Kevin could have received?

7. If $3x + 4y = 10$ and $9x^2 - 16y^2 = 20$, find the value of

   $10x - 3y$.

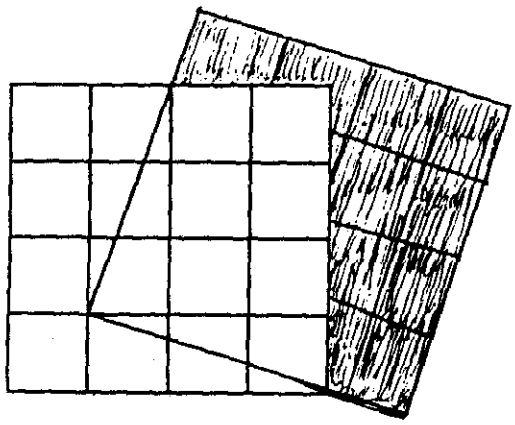
8. **a) Simplify the expression: $(2x^5y^3)^2\ (3x^{2/3}y^{1/6})^3$**
Find a if a represents the product of the exponents of x and y.

b) Solve for b: $3(2b - 5) - 3b = 8b - 9(b-1)$

c) The parabola $y = 3x^2 - 5x + c$ contains the point (-3,4). Find the value of c.

Now, find the value of $\frac{2a - 3c}{5b}$.

9. Two squares, each composed of 16 small squares, overlap as shown in the figure below. If the area of each small square is 1, what is the area of the shaded region?



10. Using the larger tractor, Dan can plow a field in 3 hours. Using the smaller tractor, he could plow the same field in 5 hours. If he has a friend drive the smaller tractor, how long will it take them to plow the field working together?

11. If $3|4x + 6| - 1 \leq 65$, and $22 \leq \frac{5}{3}(3y - 12) + 7 \leq 32$, what is the greatest possible value of $\frac{2}{y - x}$?

12. A faulty clock is set to the correct time at 12:00 noon Sunday. If the clock gains 80 seconds per hour, what is the correct time and day of week when the faulty clock indicates that 46 hours have passed? (Include AM or PM in your solution.)

13. A line ℓ with slope of 1/4 passes through the points (0,1/2) and (3,y). What is the value of y?

14. The tens digit of a two-digit number is 1 more than the units digit. If the digits are reversed, the new number is 5 times the sum of the digits. Find the original number.

15. Solve: $x = 7 + \sqrt{x + 5}$