# End of Quarter Game: Algebra

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(1 point) Solve for $x$ in the following system of equations:

$$2x - y = 7$$
$$3x + 2y = 21$$

(A) 2 (B) 4 (C) 6 (D) 1 (E) 5

(2 points) John can make a burrito in 30 minutes, while Jimmy can eat a burrito in 20 minutes. John starts with 5 burritos. Then he begins to continuously make burritos while Jimmy continuously eats burritos. In minutes, how long will it be before John has no burritos left in stock?

(A) 200 (B) 250 (C) 140 (D) 320 (E) 300

(3 points) On the most recent exam in Mr. Larry's class,

4 students earned a score of at least 90%,
12 students earned a score of at least 80%,
30 students earned a score of at least 70%,
44 students earned a score of at least 60%.

How many students earned a score of at least 60% and less than 80%?

(A) 32 (B) 17 (C) 21 (D) 5 (E) 35

(4 points) In a pie chart, all percentages are rounded to the nearest integer. This pie chart reads that 41% of math circle students say apple are their favorite fruit, while 60% say grapes are their favorite. What is the exact proportion of students who prefer apples?

(A) 41.4% (B) 41.5% (C) 40.5% (D) 40.6% (E) 40.7%

(5 points) What is the maximum possible area of a rectangle with a perimeter of 40?

(A) 100 (B) 25 (C) 80 (D) 50 (E) 49

(6 points)

$$ab = 4$$
$$a^2b + ab^2 = 20$$

What is $a^4 + b^4$?

(A) 91 (B) 257 (C) 256 (D) 145 (E) 360

(7 points) The real number $x$ satisfies the equation$x + \frac{1}{x} = \sqrt{5}$. What is the value of $x^{11} - 7x^7 + x^3$?

(A) $-1$ (B) 0 (C) 1 (D) 2 (E) $\sqrt{5}$