8th math story - linear equations

TK observed that students tended to pay attention for the first two minutes of class and then one minute out of every five after that. So he wrote the equation $y = \frac{1}{5}x + 2$ to model the number of minutes they had paid attention, with x being the total amount of time the class had lasted and y being the number of minutes paid attention. How many minutes had students paid attention 40 minutes after that first two minutes? y = ⅛ (40) +2 = 8+2 = 10

TK tried to convince students to study for the weekly test. After conducting a study, it was determined that a student's test score could be modeled by the equation y=10x+45 where x=number of hours studied for the test and y= test score. TK asked the students what the 45 stood for. TK replied: Evaluate the equation for the case when you study 0 hours. test score = 10*0 + 45 → = 45. So 45 is the score you are predicted to get if you don't study at all. Then TK wondered how many hours you would have to study to be predicted to have a perfect score of 100. So he plugged in 100 as the result and solved for x. 100 = 10x +45. Subtracting 45 from both sides, gives 55 = 10x. Dividing both sides by 10, x = 5.5. So the equation predicts that someone studying 5.5 hours would get a perfect score. What would happen if you studied more? It would be great to study even more but there would be no more points to get.

Some students suggested that if they could only have caffeine, they would stay awake in class. TK set up a coffee club. Cappuccino was $6/cup. But there were three levels of club that you could join: Bronze level costs a one time fee of $20. For Bronze level members, cappuccino was $5/cup. Silver level costs a one time fee of $50. For Silver level members, cappuccino was $4/cup. Gold level costs a one time fee of $100. For Gold level members, cappuccino was $3/cup.

Students were curious how many cappuccinos they would have to drink to save money by joining at the Gold level. One student noticed that Gold members saved $3 per cup over non-members. So dividing the cost of the Gold membership $100 by $3 (100 / 3 = 33 ⅓) shows that buying the 34 cup you start saving money. TK left the question of how many cups you had to buy before the Gold was a better deal than the Bronze to his students.

Students had to sign up for replenishing their accounts to $20 before the beginning of each week. Due to the director's intervention, students were limited to 1 cappuccino per day. Here are the equations that show the amount in each student's coffee account.

y=-6c+20
y= -5c +20
y=-4c+20
y=-3c+20

TK noticed that Bronze level members would use up their $20 credit in 4 days, at one cup per day while Silver level member would up their $20 credit in five days.

The coffee plan improved TK's popularity so much that TK held a vote among B1 students, with the winner of the election to be declared the Emperor of D2. Students could vote for either Mr. Derek or Mr. Tom.

The equation for the election was

$d + t = 30$ with d = votes for Mr. Derek and t = votes for Mr. Tom, assuming all 30 B1 students voted.

The election was held. Mr. Derek received 20 more votes than Mr. Tom. Usually, this equation would be stated in slope-intercept form:

$d = t + 20$

but it could also be stated in standard form:

$d - t = 20$

For what ordered pair (d,t) does $d + t = 30$ and $d - t = 20$? For the ordered pair $(25, 5)$ So Mr. Derek must have gotten 25 votes and Mr. Tom 5 votes.