Set 4 - Algebra, Bakery

(no calculator)

1. The polynomial $-x^3 + 7x^2 - 10x$ represents the approximate times in hours after 12:00 pm that the bakery had no orders for the giant cinnamon rolls. At what three times of the day did the bakery have no orders for the giant cinnamon rolls?
    a. 12 pm, 2 pm, and 5 pm.
2. The area of the cake boxes can be modeled with the function y = $x^3 + 10x^2 + 31x + 30$. If it is known that the expression (x+2) describes the height of the box, what is the expression for the area of the base of the box?
    a. $x^2 + 8x + 15$
3. Jorge learns ridiculously fast and constantly increases the number of cakes he makes each day. If he made 8 cakes on the third day and 17 cakes on the sixth day, how many cakes did he make on the first day?
    a. 2 cakes
4. The dimensions for cookie boxes can be taken by using the height of the box, x, and creating the other dimensions of the box, one of which is 30 longer than x and the other of which is 20 longer than x. What expression provides the area of the box?
    a. x^3+50x^2+600x
5. Lila will give Jorge a $500 bonus if he can do 50 pushups in one sitting. If on the first day, he does 10 pushups and somehow increases his number of pushups by 5 each day, how many total pushups would he have done from the day he started till the day he got the bonus for doing 50 pushups?
    a. 270 pushups

(calculator allowed)

6. When the bakery first opened during its humble beginnings, they had 9 customers on their first day. From that day onward, the number of customers increased by 8% each week. A whole year (52 weeks) later, to the nearest whole number, how many customers do they have?
    a. 492 customers
7. Gingerbread cookie sales were 100 cookies on December 25, 80 cookies on December 26, and 64 cookies on December 27. How many days after December 25 will cookie sales be about 4?
    a. 14 days after December 25.
8. It takes 1 baker to bake 20 cookies in a certain time frame. If each additional baker increases cookie output by 30%, about how many bakers are needed to bake 100 cookies in that same time frame (please round up to the nearest whole baker)?
    a. About 8 bakers.
9. The model y = $500sin(\frac{\pi}{7}x) + 200$ models the profit and loss of Lila's bakery across the week. What is the maximum loss and maximum profit she experiences throughout the week?
    a. A profit of $700 and a loss of $300

10. The employees at the bakery got bored and started playing a game. Jorge thought of a number and subtracted 2 from it. Then, he took that result and multiplied it by the sum of his initial number and +2. Finally, he subtracted 2. What expression could tell us what number he ended up with?
    a. x^2-6