Name:_____

MATH 150: QUIZ 13 (4.4)

1. (5 points) Solve $-3(x-3)(x+2)^3 \leq 0$.

2. Solve the inequality $\dfrac{(x-2)(x+3)(x-1)^2}{x} \leq 0$.

3. Suppose the daily cost C (dollar) of manufacturing x bicycles is given by $C(x) = 30x + 6000$. The average daily cost is given by $\bar{C}(x) = \dfrac{30x + 6000}{x}$. How many bicycles must be produced in order for the average cost to be no more than \$130?

Solutions

1. Make a sign chart (mark number line with 3 and -2). Then we see that the solution set is $(-\infty, -2] \cup [3, \infty)$.
2. Make a sign chart (mark number line with 2, -3, 1, and 0). Then we see that the solution set is $(-\infty, -3] \cup (0, 2]$.
3. We need to solve
$$\frac{30x + 6000}{x} \leq 130.$$
Get everything on one side and get a common denominator to get
$$\frac{30x + 6000}{x} - 130 = \frac{30x + 6000 - 130x}{x} = \frac{6000 - 100x}{x} \leq 0.$$
We make our sign chart (mark number line with 0 and 60). Note that from the context of the problem, we only consider positive values for x. Then we see that the solution is $[60, \infty)$. It follows that we need 60 or more bicycles.