

Group #: _____ Name: _____

1. (20 points) Graph the following sets on the real-number line.

(a) $(-\infty, -4) \cup (4, \infty)$

(b) $(-\infty, 6) \cap (2, 10)$

2. (30 points) In the following exercises, (a) solve for x , (b) express the solution sets using both interval and set-builder notations, and (c) graph the solutions on the real-number line.

(a) $4 - 3x \leq -(1 + 8x)$

(b) $|x - 5| \leq 3$

(c) $|x + 1| \geq 1$

3. (30 points) You are trying to help your European friends to be familiar with the American temperature scale so they know how to dress in the sunny California (temperatures are measured in $^{\circ}\text{C}$ in Europe while they are measured in $^{\circ}\text{F}$ in America). You found a well-known conversion formula that relates $^{\circ}\text{C}$ and $^{\circ}\text{F}$ as

$$C = \frac{5}{9}(F - 32).$$

(a) What range of temperatures does $0 < C < 40$ correspond to on the Fahrenheit scale?(b) What range of temperatures does $40 \leq F \leq 100$ correspond to on the Celsius scale?

4. (20 points) Airline Ticket Price A charter airline finds that on its Saturday flights from Philadelphia to London, all 120 seats will be sold if the ticket price is \$200. However, for each \$3 increase in ticket price, the number of seats sold decreases by one.

(a) Find a formula for the number of seats sold (y), if the ticket price is x dollars. What are the units on x and y ?

(b) Over a certain period of time, the number of seats sold for this flight ranged from 90 to 115 (inclusive). What was the corresponding range of ticket prices? Express your answer in the set-builder notation.