

8.3 - Compound Inequalities & Interval Notation

Note Title

Inequality	Interval Notation	Number Line Graph
$-1 < x < 3$	$(-1, 3)$	
$-3 < x \leq 2$	$(-3, 2]$	
$-2 \leq x \leq 2$	$[-2, 2]$	
$x < -1$ or $x > 2$	$(-\infty, -1) \cup (2, \infty)$ (\cup is the union symbol.)	
$x > -1$	$(-1, \infty)$	
$x \leq 2$	$(-\infty, 2]$	

① Solve (write your answers in interval notation)

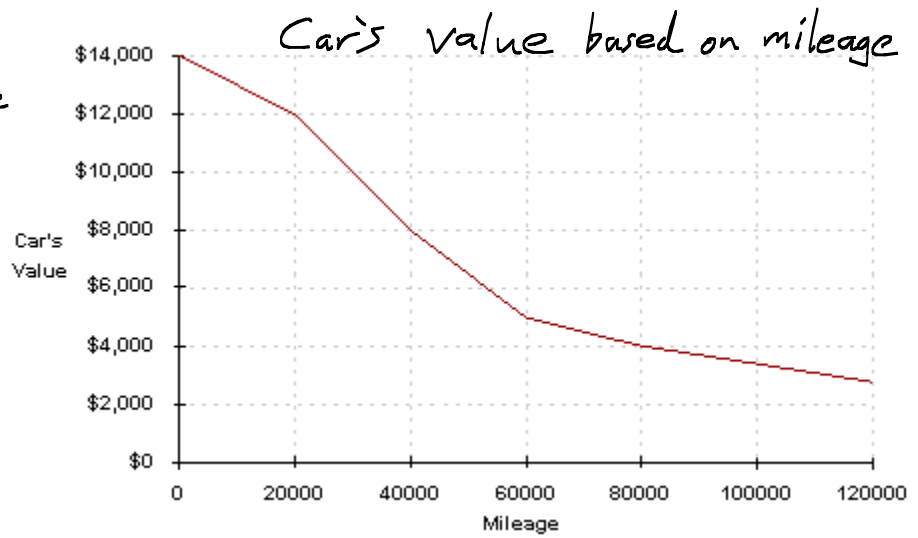
a) $3x + 4 < 13$ and $3 - 5x \leq 7$

$$b) -5 \leq 2t + 3 < 10$$

$$c) -\frac{5}{2} < \frac{1-m}{2} < 4$$

8.3

2) Write one or more inequalities that describe the number of miles, m , for which the car's value is between \$5,000 and \$10,000.



• rewrite your answer with interval notation

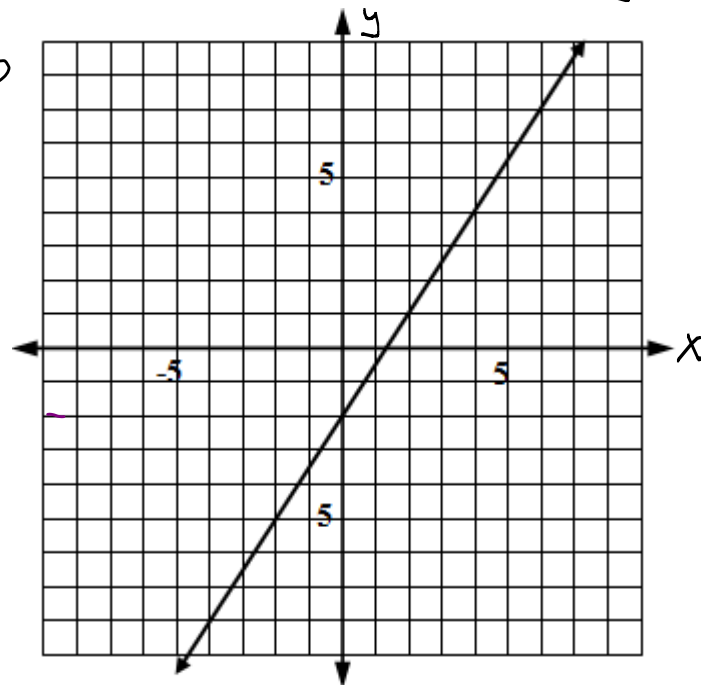
Use the graph to solve the inequality $\$8,000 < v \leq \$14,000$.
(Find the mileage that corresponds)

3) Use the abstract graph to answer the following.

a) What x 's will give $1 < y \leq 4$?

b) Describe the x 's for which y is above 7 or below -2.

c) Write your answer using intervals.



We use the symbol \cup to show multiple intervals in one solution, called a \cup .

④ Solve (write your answer in interval notation)

$$3 - 2x \geq 9 \quad \text{or} \quad 4x - 5 > 3$$

⑤ If the ground-level temperature is 80°F , the air temperature x miles above Earth's surface is cooler and can be modeled by $T(x) = 80 - 19x$. Find the altitudes at which the air temperature ranges from 42°F down to 23°F . (Source: A. Miller and R. Anthes, *Meteorology*.)

⑥ Tuition and fees at private colleges and universities from 1980 to 2000 can be modeled by $f(x) = 575(x - 1980) + 3600$. Estimate when the average tuition and fees ranged from \$8200 to \$10,500.